JUNE, 1904.

ENTOMOLOGICAL NEWS

Vol. XV. No. 6

Ignotus ænigmaticus Slosson.

EDITOR:
HENRY SKINNER, M. D.
PHILIP P. CALVERT, Ph.D., Associate Editor.

ADVISORY COMMITTEE:

EZRA T. CRESSON. HENRY L. VIERECK. J. A. G. REHN.
PHILIP LAURENT. WILLIAM J. FOX. CHARLES W. JOHNSON.

PHILADELPHIA:
ENTOMOLOGICAL ROOMS OF
THE ACADEMY OF NATURAL SCIENCES,
LOGAN SQUARE.

Entered at the Philadelphia Post-Office as Second-Class Matter.

ENTOMOLOGICAL NEWS

Published monthly, **excepting July and August,** in charge of the Entomological Section of the Academy of Natural Sciences, Philadelphia, and the American Entomological Society.

ANNUAL SUBSCRIPTION, $1.00 IN ADVANCE.

Outside of the United States and Canada, $1.20.

Advertising Rates: 30 cents per square inch, single insertion; a liberal discount on longer insertions. No advertisement taken for less than 60 cents—Cash in advance.

☞ **All remittances should be addressed to ENTOMOLOGICAL NEWS, Academy of Natural Sciences, 19th and Race Streets, Philadelphia, Pa.**

EXOTIC LEPIDOPTERA.

ERNEST SWINHOE,

Cat. No. 13 for 1904 free. 37 Addison Gardens, London W, England

The only dealers' list giving authors' name throughout. As the various species are arranged under their generic names, this list affords an excellent reference for museums and collectors. Explanatory catalogue with over 300 descriptions and many interesting notes, 12 cents.

Fine series, illustrating "Mimicry" and "Seasonal Dimorphism," 100 named specimens, 1st qual., ex. Assam., 40 different species in papers, including *P. bootes, gyas*, etc., mailed free on receipt of Post Office Order, $4.00

O. FULDA, Stapleton, New York

Always on hand:—Foreign and native Lepidoptera, cocoons, etc. List on application. Also Entomological supplies. Riker mounts.

Show Room, 816 Broadway, New York City.

A full line of Riker's Nature Studies on sale there.
Special:—A lot of Japanese Lepidoptera for sale cheap.

SUPPLEMENT

TO

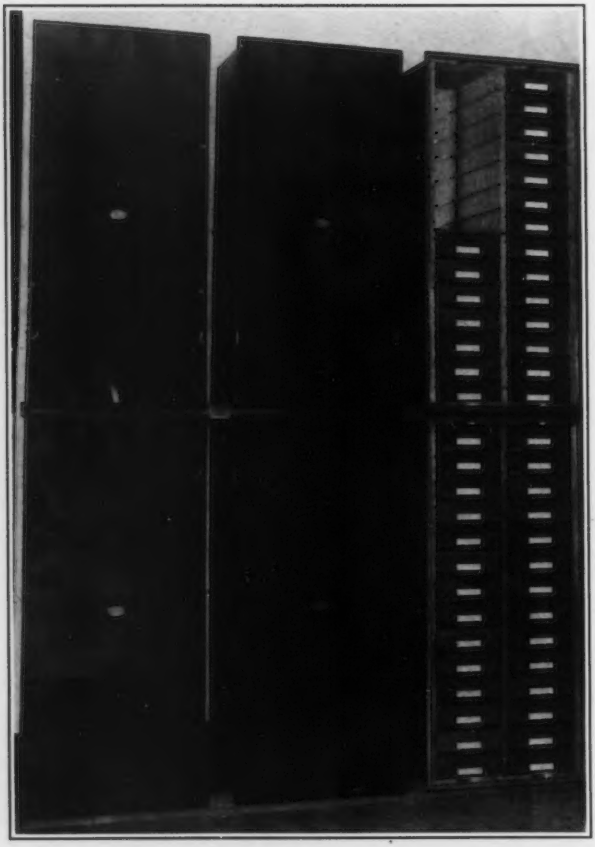
ENTOMOLOGISTS' DIRECTORY

OF MARCH 1900

has now been published. It contains Changes in Addresses, Special Study, etc., New Names, with addresses, etc., and other information. A copy will be sent *gratis* to those who have subscribed to the Directory, copies of which can still be had at **50** cents each. Address

E. T. CRESSON, Treasurer,
American Entomological Society,
P. O. Box 248, Philadelphia, Pa.

When Writing Please Mention "Entomological News."



NEW CASE FOR BOXES OR DRAWERS.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XV. JUNE, 1904. No. 6.

CONTENTS:

Viereck—A Case for Schmitt Boxes... 177
Smith—Remarks on Classification 179
Blanchard—A new Californian species of Dromæolus Kies..... 187
Girault—Attelabus bipustulatus Fab... 189
Webster—Relation of the Systematic to the Economic Entomologist..... 193
Grinnell—An early California collector 202
Newcomb—Some notes chiefly on the scarcity of Michigan Rhopalocera in 1903 204
Kearfott—Micro-Lepidoptera Suggestions, Part III..... 207
Bradley—Roproniа garmani Ashmead. 212
Ehrmann—New forms of Papilionidæ. 214
Calvert—Thaumatoneura (Odonata).. 216
Skinner—New Meloidæ from Arizona. 217
Editorial 218
Entomological Literature 219
Notes and News..... 219
Doings of Societies 223
Obituary—Rev. Fr. Jerome Schmitt... 224

A Case for Schmitt Boxes.

By HENRY L. VIERECK.

(With Plate XIII.)

The first case specially designed to hold Schmitt boxes is shown in the accompanying illustration. This case measures, inside, 41¼ ins. high, 19 ins. wide, and 13¾ ins. deep. It is made of sheet tin folded and soldered together, reinforced by outside ribs, two on the lid and one on each side. Around the outside of the case ⅝ in. from the edges is soldered a strip of tin which, with the case, makes a groove ⅝ x ⅝ in. The groove is lined with sublimated felt or rubber (the former is best because the rubber hardens and becomes useless) and receives the corresponding ⅝ x ⅝ in. rim of solid zinc on the edge of the lid. Four wire clamps permanently attached to the lid, when clamped over the projecting groove of the case, hold the lid firmly in place so that the case becomes airtight.

Inside the case is placed a wooden frame made of three upright boards, top, bottom and a shelf in the middle, the sides are furnished with cleats that make separate places for the Schmitt boxes.

Each case holds 28 boxes and makes a unit of an elastic

system interchangeable in every way. The case being air-tight keeps dust off the boxes and makes them doubly pest proof. What stands in favor of this kind of a case more than anything else is the ease with which it would permit 28 insect boxes to be removed from a building at one time in case of fire—even if not rescued the wooden boxes would be protected to some extent against the fire, on the other hand they could not become water soaked.

We are indebted to Dr. Henry Skinner for this new arrival in the Entomological Museum. Zoologists use, quite extensively, a case that suggested this one, but Dr. Skinner devised the frame for Schmitt boxes and the solid rimmed lid or cover which requires only four clamps, two on each side, while in the old case of the Zoologists there are three clamps on each side and one top and bottom. The cases can be arranged and separated as shown in the illustration, *i.e.*, enough space between the sides to permit the handling of the clamps; the bottom cases need only be separated from the floor by a two-inch plank which will keep the projecting edge clear of the floor; between the upper and lower row of cases another pair of planks is placed to keep the upper case perfectly horizontal and clear of the lower one. The case is now being adopted by two institutions, The Academy of Natural Sciences, Philadelphia, and The Connecticut Agricultural Experiment Station, New Haven, Conn. Mr. E. Daecke uses it in his private collection.

A collection kept in this kind of a case will certainly be pest proof if care is taken that no pest enters boxes that are opened for examination. One case should be fitted with shelves so that an insecticide can reach every part of it, this should then be the quarantine station into which all new material should first be placed for a sufficient length of time, before it is incorporated in the pest free collection.

In this connection we wish to introduce a new device for dividing the insect boxes into columns. We are indebted to Dr. W. E. Britton for this idea. The device is a wire pointed and bent at both ends, and should be of the same material, thickness and color of a Klæger's black pin, No. 6. The wire

should span the box. It is preferable to strips of black paper or ruled lines because it can be shifted at will, and if properly made is always strong and straight. The Schmitt box is usually divided into four columns running from bact to front.

Some Remarks on Classification.*

By John B. Smith, Sc.D.

Whenever there is a new list in any order, whether the time between lists be long or short, there is an outcry against changes; a feeling of irritation and disgust because of the necessity of learning new names and rearranging cabinets. And that is not the least of it: old species meet us under unfamiliar names, not only generic but specific; while well-known generic names are used in a way that brings despair to the older men with the habits of a lifetime to unlearn.

Lepidopterists have had of recent date no less than four distinct shocks. For ten years there had been peace, and everybody had gotten used to the list edited by me in 1891. That list, prepared with the co-operation of special students in the leading families, fairly represented the then generally accepted classification, save that more family divisions were recognized. It was realized that the order of families was not a natural one, and that there was no uniformity in the value of the divisions. It was a check-list and little more.

In 1902 Dr. Harrison G. Dyar published in Bulletin No. 52 of the U. S. National Museum "A List of North American Lepidoptera and Key to the Literature of this Order of Insects." This was revolutionary in character, and expressed the views of the author on classification and on synonymy. While much of this scheme of classification was original with Dr. Dyar, it was not all presented for the first time and, within family limits, the arrangement and synonymy expressed the views of his collaborateurs. But it was the first time the scheme was presented as a whole to the lepidopterists of the country and they

*Read at the annual meeting of the Brooklyn Entomological Society as a Presidential address.

were lost in its mazes. The list as it stands is a useful piece of work, wonderfully accurate for its extent, and as a whole based upon what I believe to be a natural system. To one familiar with the literature, the specific index is enough to locate the species, but the absence of generic synonymy, of all reference to the description of synonyms, and the perhaps unavoidable brevity of the references generally, left the average collector helpless before a sea of unfamiliar names arranged in unfamiliar order without any point of attachment to his previous guides. In certain series, notably the butterflies, the generic divisions were at variance with those generally accepted by American students, and were adopted from Scudder without renewed or original study by Dr. Dyar. Some of the arrangements and synonymy in the Noctuidæ did not agree with my own views in the matter and, after some consultations, a new edition of the check-list of 1891 was determined upon.

In this, Dr. Dyar's general scheme of classification was accepted with some modifications; but not the synonymy, generic or specific, which was more closely approximated to the old list. While many changes were necessary they were, so far as possible, indexed to the previous list, that with some little labor the possessor of the old list could find nearly all its species in the new edition.

Hardly had the new list been generally distributed before Sir George F. Hampson's volume of the first series of the Noctuidæ appeared, and this complicated matters further. It was inevitable that, when the described species of all faunal regions were collated, many generic and some specific synonyms should be found. It was also inevitable that, viewing generic bases from a somewhat different standpoint, there should be some divisions of described genera and some combinations, resulting again in an aggregation differing radically from the two lists previously mentioned. Some genera get new types,—*i. e.*, other species than such as have been heretofore accepted,—and the order of genera is completely changed. *Noctua* is now used for what we have called *Erebus*, and other well-known names disappear completely.

Most recent of all is Dr. W. J. Holland's Moth Book, in

which the nomenclature of the Sphingidæ is based upon the work of Rothschild and Hartley. We are here asked to forget all our previous associations of names and structure and to learn a totally new combination. *Sphinx* is no longer typified by species resembling *chersis;* it is now applied in the sense in which we have previously used *Smerinthus*. *Sesia* is no longer a clear-wing; but its representatives are our species of *Ællopos*,—and so on.

We have heard of discussions concerning the "whichness of the what," or the "thusness of the that," and have considered them as jokes; but the state of uncertainty at present existing as to our lepidopterological nomenclature is no joke at all.

The question naturally arises,—what causes all these differences of opinion, and why are such changes necessary? Before pointing out some of the difficulties, I want to record a little conversation had with one of the authorities in another order, wonderfully familiar with the literature in his own as well as other specialties. He cited a recent work in which the author proves to demonstration that a particular species must be the type of a given genus. There seemed no escape from the conclusions of the publication until, a little later, another was issued by another author who was equally convincing in his proof that a totally different species was the type of the generic name.

Of course this aroused interest, and my friend concluded that, as he had all the publications referred to, he would look the matter up himself. He did so, and concluded that neither of the previous writers was correct; but that an altogether different species must be considered as the type! Now here we have three authorities, with exactly the same evidence before them, coming to three distinct conclusions; and each is firmly convinced that he is right.

How does it happen, then, that so much difference of opinion is possible when the evidence is all before us?

When Linnæus first used his binomial system definitely, in the tenth edition of the Systema Natura, which is accepted as a starting point for our nomenclature, he used the terms *Papilio* for all butterflies; *Sphinx* for all hawk-moths and some other

things; *Bombyx* for spinners and the like; *Noctua* for owlet moths, etc., all his generic names being now used with family terminations.

Linné did not, of course, express any generic type, and his descriptions were as general as the species under them were various.

Following Linné, came Fabricius and, while he was yet writing, Scopoli, Laspeyres, Latreille and others.

Each of these authors used the Linnæan names and added new ones: and they differed a little in their application of the terms. Now here comes the first chance for a disagreement. Some authors hold that the first specific name under a genus must be held to be its type and, because Linné placed *ocellata* at the head of his list of *Sphinx*, that species must be the representative of that generic name forever. Other authors claim that when a generic term is used, all the species under it are equally representative and, unless the author has in some way indicated a particular species, a subsequent student has the right to divide the genus as he wishes, and may confine or restrict the original term in any way that he chooses. In 1805, Latreille described *Smerinthus* and used it for Linné's first group of *Sphinx*, including in it *ocellata*. If Latreille had the right to do that, *ocellata* was no longer a *Sphinx* and could not serve as the type of the genus. Here, then, we have two schools at once,—in one of which *ocellata* is a *Sphinx*, in the other of which it is a *Smerinthus*.

In 1775, Fabricius proposed the term *Sesia* for our *tantalus* for the clear-winged *Hemaris*, etc., and included in the term also the little species now called Sesiidæ in our list. For those of the first-named school *tantalus* is and ever must be the type of *Sesia*.

But in 1777, Scopoli separated off *stellatarum* and allies as *Macroglossa* and, in 1801, Laspeyres in a general work restricted the term *Sesia* to *tipuliformis* and its allies. These changes and restrictions have heretofore met with general acceptance, and I must confess that personally I cannot follow Messrs. Rothschild and Hartley in making the changes they adopt in our nomenclature.

Hübner began to write in 1793, or thereabouts, and in 1806 published the celebrated "Tentamen," a very suggestive classification of the Lepidoptera in which a number of new names were proposed, with each of which a known specific name was associated. There were no descriptions, no explanations, only names; suggestive enough to one who knew, absolutely unmeaning to all others.

Here we come to another opportunity for disagreement. One school holds that each new name being associated with a known species, that species thereby became the type, and this was all that was needed. The other maintains that such a term is a *nomen nudum*, a naked name to which no definite meaning is attachable. As a number of authors, including Ochsenheimer, were then writing, it becomes a question of some importance to fix the status of the "Tentamen." Hampson ignores it. Dyar accepts it. So we have an added opportunity for differences in generic terms, and there is nobody that has authority to settle the differences. Some authors, including myself, recognize secondary sexual characters as sufficient for generic separation,—*i. e.*, a series of species with pectinated antennæ in the male may be generically separated from a series in which these appendages are simple in both sexes. Hampson and others hold that such characters should not be used, but that a genus should be equally recognizable in both sexes. I rather sympathize with that view of the case; but the result of its adoption gives us horribly unwieldy genera, and as genera are for convenience of classification only, I have deemed it best to admit the use of characters peculiar to one sex only. I remember I told Dr. G. H. Horn, many years ago, that in my opinion there should not be genera which could be determined from one sex only. His reply was, "Until you know both sexes you do not know the species, and when once you know the species there is no difficulty in recognizing the genus." I have kept this point in mind ever since, and it really decided me in favor of the practice that I have adopted.

The important feature here is that by this difference of opinion Hampson's work differs from mine in certain generic divisions and, so long as we continue to differ, the same specific name may appear under different generic terms.

It happened occasionally that a peculiarly fitting term was applied in different orders of the insects, in a different class of the Animal Kingdom and even in the Plant Kingdom. When that was the case the term stood for its earliest use, and the later or preoccupied name fell; anybody could propose a substitute. As descriptions multiplied, this became a troublesome matter, and it was finally agreed that a term might be used in both Animal and Plant Kingdoms; but only once in each.

As specialization increased, men confined their studies to one class and, in the insects, to single orders; the literature increasing in proportion to the number of students. Furthermore, as new territories were settled and explored, investigators limited their work—often of necessity—to one faunal region, and the entomologist in central North America had little chance of knowing what was done by the conchologist in central India. So further duplications took place, and the same name was used in different classes and in different orders. It is technically allowable for anyone who discovers that a generic name is preoccupied anywhere in the Animal Kingdom to propose a new one, and it is a cheap way of satisfying a *mihi* itch at the expense of one who has done real work, but has not had access to literature. Personally I never change a name unless it is preoccupied in another order, and I have been slow in recognizing changes made because a name was preoccupied in another class. Practice varies, too, as to what names may be changed: whether they must merely sound alike, have only the same derivation, or must be literally alike. Lord Walsingham, for instance, would consider *Sesia* and *Setia* alike, because he pronounces them so; but to one who gives the *t* its value this seems absurd. Some claim that the hard *C* and *K* are the same, and that *Cobalos* and *Kobalos* are duplicates, though with a differing initial,

All these points are factors which afford opportunities for disagreement, resulting in differences of generic or specific names used. To some the letter is of more importance than the spirit, and that a change made on a technicality upsets a century of general acceptance and use matters not in the least; in fact it seems rather a delight to them to replace a name in

general use by some term long since abandoned or lost sight of, if a possible excuse can be found for it. Sometimes a question arises whether a wrongly written or printed name may be changed if it thereby becomes a synonym.

It is literally a case of many men many minds, and to the collector, without the basis for an opinion or a knowledge of why things are done, all seems chaos, and he simply follows whatever list he has or whatever authority has his confidence. I quote from a recent number of the Ent. Record and Journal on "Variation."

"The average collector * * * * does not care a dead mite for priority fancies. He asks for uniformity at any price, and in the existing welter of opinions, will not bother his head about who misspelled a name first and stuck to it, and who dared to correct the printer's blunder, or started a system of his own, necessitating a host of new divisions and subdivisions,—all intensely interesting to the scientist, but actually repugnant to the field naturalist and the 'mere collector,' for whom the rose smells as sweet whether it be called a rose or redescribed as var. William-Allen-Richardsonii."

While what I have said has been in comment on recent work in Lepidoptera, it applies in principle to other orders also, and there are some in which there are differences of opinion quite as great.

Now I admit to a little conservatism in some directions; I don't mind smashing things where I think they deserve it and, of course, I admit everybody else to the same privilege; but it seems to me that there is a difference between an attempt to correct a supposed error of observation or interpretation of structure and an attempt to change names only.

Classification is, after all, only a scaffolding upon which we hang our knowledge, and names and divisions are mere pegs to indicate the combination for which they stand. Every time we change the combination indicated by the peg we disturb the system. What injustice is done to Linné by using *chersis* rather than *ocellata* as the type of *Sphinx*, and why should not Latreille receive recognition for his limitation of the broad term, and credit for the new term proposed by him?

The ornithologists have tried to regulate cases of this kind, and Canon XXI of their code reads, "When no type is clearly indicated, the author who first subivides a genus may restrict the original name to such part of it as he may judge advisable, and such assignment shall not be subject to subsequent modification."

This seems in accord with justice and common sense, and this rule has been generally observed by American authors. I am sorry that Dr. Holland has accepted a nomenclature in conflict with it, because personally I shall not feel able to accept the changes.

There is only one real entity in nature, and that is the individual. No two specimens are exactly alike, however much they resemble each other. Each has a combination of characters peculiar to itself and which it may transmit to its progeny, in whole or in part, or with some modifications. An aggregation of individuals which mate freely and produce fertile young is a species, and most species may also be considered as natural divisions. Individual variation does not go beyond a limited range, and it nowhere touches or encroaches upon the range of another species. But, while this is true in general, there are exceptions, indicating that the process of species-making is yet a part of Nature's evolution. This, however, forms a topic too large for an address of this kind.

When we leave the species, Nature places no restriction upon the systematist. He can make genera, families, superfamilies, and orders as he pleases, and may base them upon any characters that seem good to him.

It may be possible some day for entomologists to reach some common ground upon which all may and will stand; but the present is a stiff-necked generation, of which every individual believes that he is pretty nearly right, and I am not counting upon the arrival of the happy day in my lifetime.

THE tick mentioned in ENT. NEWS, Vol. XIV, p. 212, has been kept in the small turned wooden box with a tight-fitting lid, and has not had any food or water. The box has been kept in a roll-top desk, closed at nights. At this date, May 1st, the tick is alive and hearty, and is now nearly two years old.—H. SKINNER.

A new Californian species of Dromaeolus Kies.

By Frederick Blanchard, Tyngsboro, Mass.

Dromæolus hospitalis n. sp.—Form elongate, nearly parallel, narrowed at apical third, black rather shining, prothorax dull, with short brown pubescence inclining to yellowish at sides of elytra near the base. Antennæ dark piceous or black, somewhat brownish apically, slender, filiform, slightly longer than the hind angles of the prothorax, first joint more or less evidently carinate its whole length on the lower side, second a little longer than the fourth, third about equal to the next two which are short, subequal, joints six to ten longer, subequal, the eleventh nearly as long as the two preceding; head convex, densely punctured, with a fine median smooth line more or less evident especially in front; prothorax as broad as long in the female, or slightly longer than broad in the male, and as wide as the base of the elytra, sides straight, parallel, arcuately narrowed at apical third, disc moderately convex, median line strongly impressed at base and reaching the middle, or even feebly continued to apex, surface densely rugosely punctate, less densely on the disc from middle to apex, more densely at the sides; elytra substriate, finely, not closely punctate, the punctures a little coarser at base; beneath, the prosternum and sides of metatarsum rather strongly not closely punctate, propleura more coarsely and closely punctate, the punctures extending quite to the lateral margin posteriorly, obscuring the antennal groove; hind coxæ and abdomen more finely and closely punctate, anal segment more coarsely and very densely and roughly punctate at apex; metasternum with a fine smooth line at middle; triangle of the propleura not twice as long as wide at base, the antennal groove strongly impressed anteriorly, not distinctly limited externally and obsolete behind; legs black, tarsi brown, the fourth joint of the latter as wide as the third and distinctly emarginate above receiving the base of the fifth joint. Length 7–10 mm.

The foregoing description follows very closely that given by Dr. Horn, in his Monograph, of *D. basalis* Lec. In his synoptic table Dr. Horn defines *nitens* and *basalis* by the "marginal grooves of thorax shallow, not sharply limited internally." In all three species the antennal grooves are deep anteriorly, rapidly shallowing behind. They are best defined in *nitens*. In *basalis* the internal limit is evident, though feeble. In *hospitalis* it quite disappears, the coarse punctures encroaching upon the very shallow continuation of the groove behind. The general appearance of *nitens* is more shining, the pubescence being distinctly fine and the prothoracic punctures less close upon the disc, although dense and rugose at the sides, much as in the other two species. The anal segment is similarly densely

punctate at apex in *nitens*, and the fourth joint of the tarsi is as wide as the third. The prothorax in *basalis* is apt to be a little wider than the elytra, with the sides feebly arcuate and, by comparison, a little less densely punctate and rugose than in the new species. The punctuation beneath is finer, especially upon the abdomen; the anal segment scarcely different from the others. The fourth joint of the tarsi is very small, feebly impressed and distinctly narrower than the third. The distinct cinereous pubescence at base of the elytra in *basalis* is slightly tinted in the present species by a few paler hairs at the sides of base. The character noted by Dr. Horn,—triangle of prosternal parapleura twice longer than wide in *nitens* and less than twice as long as wide in *basalis*,—is rather difficult to appreciate. The present species, while partaking somewhat of the characters of both *nitens* and *basalis*, does not appear to be intermediate. It might be placed after *basalis* because of the still more feebly defined antennal grooves, although by its general form and its tarsi it more resembles *nitens*.

Mr. L. E. Ricksecker, of Santa Rosa, Cal., July 7, 1897, obtained many specimens of *hospitalis* and *nitens* at the same time from a decayed Alder stump, "that had presumably been floated down Russian river during some freshet, and deposited a few miles below the mouth of the river on Wright's beach." Mr. Chas. Fuchs, of San Francisco, has submitted one specimen from "Boulder Creek, Santa Cruz Co., July 5, 1895."

Dromæolus californicus Bonv.—This species has a short, deep impression or groove on the median line of the metasternum.

Mr. Ricksecker has taken the species from decaying stumps of the Douglas spruce at Sylvania, "May 17, 1900."

THE EGGS OF KERMES GILLETTEI Cockerell (family Coccidæ).—Newstead cites as the maximum number of larvæ from one female Coccid 6258, from *Walkeriana pertinax* Newst., found in Africa.

Upon examination, I found a female of *Kermes gillettei*, collected by Mr. Cockerell at Manitou, Colo., to contain 6676 eggs. The eggs are an opaque white color, and in form long oval, measuring 120 to 135 μ in width and 220 to 244 μ in length.—L. C. HIMEBAUGH, Biology Dep't, Colorado College.

Attelabus bipustulatus Fab.

(COLEOPTERA.)

Theory of Oviposition and Construction of Nidus; Miscellaneous Notes.

By A. Arsene Girault, Blacksburg, Va.

May 18.—Many egg-cases found on different species of Oak (*Q. rubra, nigrum, alba*). Most of them have been hanging for some time, being browned and brittle; a few under construction. Eggs present.

I.—General method of construction of nidus, with observations showing method followed for different oak types.

♀ simply makes a crescentic, smooth-edged incision along margin of the leaf; this incision extends from a point on the margin on each side of one of the principal veins from the midrib, to this vein, the latter thus continuing through the section cut out, forming a petiole for the nidus after construction (*vide* figure). It is now obvious that the nidus is formed from the portion of the leaf separated out by this crescentic incision; the separated section is simply rolled up.

1. First method of construction and oviposition. Q. rubra.

May 22—*rubra.*

(a) *Construction of nidus.*

After cutting out section of leaf, as shown in foregoing, the female crawls slowly up and down the midrib of the section on the under side and creases the leaf, using its legs as levers, biting afterwards with its jaws to keep the crease in place. It repeatedly folds the section face to face in this manner,—*i. e.*, by sprawling the legs on each side, apart and over the midrib, and then bringing them together, generally using the legs on one side of the body as a force, the corresponding opposite ones as a base against which the force is applied. (Analogous to the thumb and fingers. Imagine a leaf held, face out, petiole down, between the thumb and fingers, so that the midrib is equidistant between the base (thumb) and the force (fingers); now if the leaf is folded so that the two upper faces are approximate, the midrib forming the line of creasage, or the hinge, it exactly illustrates the relative position of the dextral and sinistral series of legs.)

It continues the creasing, going up and down the midrib of the section until the two upper faces are *approximate.* Then it makes diagonal creases from the midrib, crawling slowly with the beak applied to the

Explanation of Plate.—Leaf of *Q. rubrum*, showing at *ab* incision made by beetle; the shriveled section isolated, and the natural outlines (the dotted lines) of the section from which the nidus is made; the vein *d* forms the petiole of the nidus.—Orig.

surface of the leaf as if actually creasing with the beak. (This could not be determined because of the movements of the leaf in the wind. It does, however, bite the crease after formed. Analogue: pinching a piece of paper after folding.) Two diagonal creases are made, one on each side; another short, transverse, deeper one is made at the edge of the leaf on one side near the base.

After the leaf is creased, and the faces are *approximate*, the slender tip is folded over against the faces, and the fold or joint twisted. Then, by turning in one end of the section obliquely, tucking in the while, the section is nicely and neatly rolled into the nidus, the base perfect, and the slender tip peeking from the apical end. The tip is afterward tucked in carefully, some time being given to the process.

(b) *Oviposition.*

Oviposition then takes place:
(1) in the rolled tip before tucked in, the more probable, or
(2) in the rolled tip after tucked in.

Finally, the beetle comes to the small petiole, or portion of the vein connecting the section with the main leaf, slight enough already as a support for the nidus. This is cut in such a manner that the case will fall in a short time from natural causes. In one case the beetle returned after a short while, and wrapping one of its cephalic and one of its intermediate legs around the petiole, snapped the connection, the nidus rolling to the ground. An egg was found concealed within the twisted tip.

2. Second method of construction and oviposition. Q. nigrum. Q. alba.

June 1—*nigrum.*

(a) *Construction of nidus.*

♀ simply folded the section of leaf face to face. the midrib forming the hinge. Differs from the first method in that the two (2) faces were not *approximate*, but *flat* together, the case being made by rolling up the leaf section after it has been folded *flatly* in halves.

This species of oak has no tapering apexes, and thus no projecting end in which to lay the egg.

(b) *Oviposition.*

After it has rolled up a small portion of the section, in a crevice formed by the folds the egg is laid. The section is then rolled completely up, enveloping the egg within its folds. Analogue: rolling up a strip of carpet and placing a tack on it after a portion has been rolled, and then continuing the process.)

June 23—*alba.*

(a) *Construction of nidus.*

The method given in foregoing (June 1, *nigrum*) seems to have been carried out in at least a majority of cases coming under observation.

(b) *Oviposition.*

Similar to that given under *nigrum.*

II.—Classificatory outline, showing theory of nidus construction and oviposition; summary.

It seems probable and possible, from the foregoing, that the method of constructing the nidus varies according to the species of oak and the two main leaf types represented by these species. Those made from *Q. rubra*, and species of the same group, are *probably* constructed as under the first method; indicated both by observation and by old cases. While those on *nigrum* and species of the *nigrum* group including *alba*, with broad tipped leaves, are constructed as given under the second method of construction, flatly; evidence by the cases found on the ground under these oaks, and also by observation. These points need further investigation.

1. Type: *rubra*, group of *Quercus*, including all species with acute or slenderly tipped leaves, as in *rubra*, etc.
   (a) *Construction of nidus.*
   Section cut as usual; leaf faces *approximate*, rolled obliquely with slender tip projecting.
   (b) *Oviposition.*
   In the projecting slender tip after rolling:
   (1) before tucked in, more probable;
   (2) after tucked in.
2. Type: *nigrum*, group of *Quercus*, including all species with obtuse leaves, as in *nigrum*, *alba*, etc.
   (a) *Construction of nidus.*
   Section cut as usual; leaf faces *flat*, rolled in the same straight line.
   (b) *Oviposition.*
   In crevice of partly rolled nidus.

Hence, construction of nidus depends on shape of leaf, which depends on *group* of *Quercus;* and oviposition varies directly with the method of construction.

III.—Miscellaneous Notes.

(a) *On time of construction and oviposition; from a single observation.*

Incision . . .	30	minutes. (?)
Creasing . . .	15	"
Rolling . . .	9	"
Oviposition . .	6	"
	60	"

(b) *On habits.*

The adults eat small, round holes from both surfaces of the leaf. They are not easily disturbed, and do not readily "play 'possum," as do the *Curculios*, but apparently have to be forced to do so. When they do, it is not done half so well, nor is it so real nor as lengthy, as with the *Curculionidæ*. It is much more of a sham and requires no loss of patience to the observer, for it is no sooner done than over with.

The females apparently live for quite a period of time, and do all of the work on the nidus excepting perhaps during the early part of their lives as adults, when the males may occasionally condescend to help them. On May 18th the two sexes were observed together, the male on the female's back taking no part in the work. After that date the males began to disappear; none were observed taking actual part in the work.

At times the females have much trouble in making the nidi, and many abandoned ones have been found; several cases have been found side-by-side, probably deserted by the same individual. Most of the trouble lies in the cutting out of the leaf section, in the selection of a wrong portion of the leaf, and making the crescentic incision in the wrong place before the mistake is discovered; or, in other words, faulty instinct comes into play. As many as three (3) nidi have been found on a single leaf.

(c) *On period of oviposition; May 18th–June 23d.*

The period of oviposition is quite long, covering perhaps six (6) weeks, three in May and three in June; the dates given are those recorded from observation, the last one (June 23d) based on the fact that a female was observed constructing a nidus, and hence more or less doubtful. I noted on June 2d that they were still ovipositing, on June 4th that but a single individual was seen, and that the period of oviposition was probably at an end; the next date (June 23d) records the fact just stated in regard to female making egg-case, and on June 24th the last beetle was observed, then thought to be the forerunner of an overlapping second brood, but evidently a straggler. Hence, the period of oviposition extended practically to pune 4th, theoretically to June 23d.

(d) *On development; larvæ, nidi.*

June 2d—Eggs found in all cases examined; no larvæ.

June 4th—Most of the nidi have fallen to the earth, and have begun to decay. They are easily found lying amongst the grass, and were numerous. Not a single larva found in ten (10) examined. Many of the nidi were partly unrolled, due to moisture; others fresh and newly fallen; majority old and brown. They hang to the tree for several days, perhaps a guard against too much moisture.

June 12th—Two larvæ found in many cases examined; eggs about to hatch, abundant. The cases containing larvæ were full of frass and other evidences that they were feeding from interior portions.

June 23d—Several cases examined this morning, finding indications of the presence of larvæ. At last a nearly full-grown larva was found in

one, the case being reduced to a mere shell, the larvæ filling the whole of it; lost. After this, several younger and much smaller larvæ were found.

June 24th—Larvæ, a single egg, and adults found to-day; pupæ perhaps also present. The last adult observed. Attempts to obtain pupæ a failure.

Annapolis, Md., 1901.

May 7th—Cases and eggs abundant, also adults; cases measure about 5 mm.

May 20th—Larva obtained from cases in stage.

May 30th—Oviposition continues; fresh eggs present. Find great difficulty in attempts to rear. Very young larvæ present; no pupæ obtained.

The egg is probably laid before the case is rolled up, although one examined when partially rolled and under construction yielded no egg. (*Q. rubra?*)

Credit is due Mr. John F. Strauss, Washington, D. C., for the rough draft of the figure, and to Mr. J. Francis Linthicum, Annapolis, Md., for recopying.

Relation of the Systematic to the Economic Entomologist.

By F. M. Webster, Urbana, Ill.

I go to my farm in spring, and my tenant points out to me a young colt frisking about beside its mother. Five or six years after I observe him working a horse in harness at the plow, and I ask him where he obtained his horse; and he tells me that it is the colt that I saw besides its mother some years before, except that it has now developed to a horse. I ask him when the colt ceased to be a colt and became a horse, and he cannot tell me, though he has probably cared for it and watched over it nearly every day since its birth; yet, despite all of this, he cannot give me the exact date when the colt became the horse. He has given me an honest answer, and I do not think less of him for having done so.

My children grow up to manhood and womanhood, and I ask the mother when they ceased to be boys and girls and became men and women, but she can not tell me. We know that, legally, they reached maturity at 21 and 18 years of age, but we also know that some children are more mature at the age

of 16 or 18 than others are at 25, and no law in christendom can change these conditions.

I go to the entomologist who describes species and ask him what constitutes a species or a genus, and he honestly informs me that he does not know and cannot therefore tell me. Why should I wonder? We are dealing with ready-made problems, involving organisms over which we have not the least control, and of which we really know but very little. Animal life in general, and insects in particular, possess an almost unlimited capacity for adaptation to changed conditions, but they did not obtain these advantages by any skillfully planned effort of their own. They have varied in the past, are varying at present, and will continue to vary in future, according as their environment is unsuitable; not because they set out to do so, but because they cannot help it. If we wish proof of the fact that insects, of all animal life, are the most susceptible to variations of environment, we have but to consider their countless number of different forms, intergrading into each other on the one hand and away from each other on the opposite. Where, in its evolution from the stem, does it cease to be the one species and become another and independent species? Until we learn this we cannot establish a fixed law that shall regulate the extent to which a species may vary, but must leave this important duty to the individual describing it; and as humans vary as much mentally as they do physically, and labor under different environments, the way out of our dilemma does not appear at all easy. I have in other papers compared the describer of species to a pioneer, because his work must come first. It is he that must bridge the chasm confronting the morphologist. Until a form is described, we cannot well indicate it and refer to it clearly and distinctly, and, unless it is given a name, we cannot do this without each time repeating the description. This is all there is in a description or a name, and when the systematist has done this, his work is ended. Beyond this, he lays aside the systematist and becomes the morphologist. He has built the bridge; whether it is perfect or faulty, whether it is safe or dangerous, is a matter that those who are to use it must settle. If a description does not describe a species, or if a name does not designate a species

from some other one, of what use is either to those who must use them in the advancement of knowledge? The man who crosses the bridge is not to blame if it proves inadequate for the purpose for which it was constructed. He is simply striving to advance; the structure does not meet the reqirement.

The morphologist does not care who describes and names a form; whether he is old or young, rich or poor, a catholic, a protestant or a jew; what he wants is truth, and he is compelled to have this before he can go on with his investigations. The systematist who helps him is a benefactor, for he is reaching out in every direction for assistance.

Let me return to my illustration of the bridge. An army, which you may term morphologists, if you choose, is encamped on the bank of a river which it must cross before it can accomplish the end for which it was brought into existence. There are no bridges and the flood is deep and the current swift. The pioneer corps sets to work to construct the bridges, but the engineers disagree as to the proper location, some claiming that an old structure was reared a century or so before and the old abutments are safe and should be utilized, while another faction disputes this and says the abutments have become unsafe, and another location is preferable, while a third faction favors a different structure, in a different place, each insisting that they and they only are right. Construction begins, but the builders disagree as to the method of doing the work and in the material to be used; one faction puts in place and another pulls down; sometimes one faction has one end of a girder or timber and another faction has equally strong hold of the other end and both pull in opposite directions. They sometimes accuse each other of defects, both mental and moral, until the morphologist becomes discouraged. You say that a good commander would remove half of the corps and let the remainder proceed: but which half, please? The army wishes to get across; if the construction corps is weakened it will be long delayed. Half the work being done is useless and half the workers are simply in the way of the other half, while the army is idle and, to an extent, helpless.

Now, I have drawn you a picture. It is not a pleasant one to look upon, but it is lifelike and up to date. Entomology

is advancing in this country by leaps and bounds, but it is not the advance of a well-drilled army but more like that of untrained recruits, whose object may be the very best, but in their enthusiasm and zeal they get in each other's way. It is said that in the far west, if a bunch of mules are beset by wolves, they collect together in a circle, heads inward, and kick outward toward their enemies; but sometimes systematists reverse the position and kick each other. The fact is, no one willingly obstructs the progress of his fellow; but entomological nomenclature has driven more than one good student to other sciences, where these difficulties are reduced to the minimum.

The one who describes a new species, that *is* new and not a mere trivial variation of an old and well-known one, has done the world of science a direct favor that will live and grow after he has himself passed away; but if he has only happened upon an individual with one more or one less puncture than one already described, or of a shade different color, or with a few more or a few less hairs, though the habits be the same, and describes this with a long name and publishes his work with a flourish of trumpets, he has simply gotten in somebody's way, and his work will continue an obstruction long after he has been otherwise forgotten. It seems to me, in this day and in the present stage of progress, the systematist might, without serious injury to the cause, vary that well-remembered adage to "be sure he is right, and then"—look again! When the undescribed material began to dwindle away, as it has in some groups, it was to be hoped that those who must continue to write descriptions would turn to a more careful examination of the things themselves, and study nature by the comparison of different species, using the insects themselves for comparison. But the current has seemingly turned in another direction, and in this advanced age insects themselves are no longer essential, as with a supply of old musty descriptions, written when it was impossible to work as accurately as at present, species and genera galore can be made and unmade without the trials and tribulations of the collector being experienced at all. And the fine points of literary distinctions that are brought into active

service remind me of the young lady who insisted that it was not at all appropriate to go out *buggy*-riding with anybody except an entomologist. The descriptive work of the older entomologists was crude and primitive, it is true, but they did the best they could at that time, and the only wonder is that they did so well; and though there was less hunting for obscure punctures and hair-splitting differences, their work will line up, so to speak, with that done today; but to graft the one onto the other is at times almost like attempting to weld platinum onto cast iron. Some of the older work must of necessity give way to that of a more concise character; but we are in danger of forgetting that all of this is preliminary to the main object, that of enabling us to go on in getting a better and broader knowledge of animal-life and the inter-relationships existing between the different subdivisions that we arbitrarily erect. Nomenclature is a means and not an end. How often does the systematic entomologist for a moment consider whether or not the description of a new species from a single individual, not always too perfect at that, which differs but slightly from some other species of precisely similar habits, will enable his fellow worker in the applied science, or in morphological investigations, to solve some obscure problem of insect attack or diffusion! Does he ever stop to think that a valid species is a veritable guide-post to prevent the investigator from losing his way, while a synonym is a rock in his pathway, that at best only obstructs his progress?

Synonyms are not so bad if, after they have died and are buried, they would only stay dead and out of the way; but such is not the case; on the contrary, they are liable to be suddenly resuscitated and again torment the morphologist. Names that have been in use for a half or three-fourths of a century, and are current the world over, are suddenly displaced by one that has never come into common use, is even less applicable to the insect, and for no other reason than that someone a few years earlier described a form thought to be the same. *Mytilaspis pomorum* is a good illustration, as it has lately been displaced by *Lepidosaphes ulmi* Linn., when, as a matter of fact, Linnæus seems to have never described the

species, never figured it and, strictly speaking, never named it, as he only named Reaumur's figures of a Coccid on elm. Surely, such work as this does not advance the science of entomology, and one can hardly believe that the ashes of Linnæus are additionally honored by this revolution in nomenclature. The generic name was applied to the species by Shimer many years ago, but nobody else has used it until lately. But this is not the worst case by any means. In 1824 Thomas Say published a good description of *Smerinthus geminatus*, accompanied by a most beautiful and accurate illustration of the moth, drawn by Mrs. Say. In breeding a number of these moths, there sometimes appears an occasional individual with a single ocellus, and there is every gradation between this and the typical form. It so happened that Drury, in 1773, described this form as *jamaicensis*, with the statement that it came from Jamaica. Now, it has never since been found in Jamaica—it is only an extreme variation, and as stated by Dr. Smith, though this name has priority, it is not only a misnomer, but is inexpressive and absolutely misleading. The description does not describe the species at all, yet because of priority of publication, Say's name has recently been reduced to a synonym, after having been in use for over 75 years and filling all the requirements of a name. But let us imagine a parallel case. A naturalist, from Mars, for instance, lands on earth and begins to describe species beginning with man. He happens to alight in Patagonia and forthwith describes one of the most degraded forms of the human race. Another investigator, a few years after, happens to alight in the north temperate zone, and describes, we will say, the Anglo-Saxon. Now, following this same law of priority, and with no less regard for the truth that science is supposed to portray, the Patagonian must forever be the type of the human species, while the Anglo-Saxon must content himself with being a bleached-out synonym. This is a good illustration of what I have in mind when I say that some men are getting in the way of others. Again, we have been lately surprised to see the name of the codling moth *Carpocapsa pomonella*, a name by which it has been known so long that there is no difficulty

in making any entomologist in any country understand to what species you refer in applying that name to it, suddenly transformed to *Cydia pomonella*. But, before entomologists have had time to get their labels changed to conform to the new regulation, there comes a bulletin from the Department of Agriculture, with the old name reinstated, with an explanation that it is the proper one to apply to this insect. These two publications emanating from institutions almost within a stone's throw of each other, within the space of a few months, the one contradicting the other, offer a good illustration of my bridge building. Probably every fact that was available for the use of one writer was equally available to the other, and there was absolutely no excuse for this double change in the nomenclature of this, one of the most common and important species with which the economic entomologist has to deal. Of course no wrong was intended by anyone, but is it any wonder that the mass of people get disgusted with these things and young students discouraged? If this keeps up, notices of changes in nomenclature will have to be sent out by wire or 'phone; the usual method of publishing these is certainly too slow. Of course there will be the danger of head-on collisions, between priorities while in transit, and two may reach an entomologist at the same time and leave the poor recipient utterly befogged as to which to follow. I have noticed that, even now, when entomologists greet each other, instead of the genial hello, which I have heard ring out so full and jolly, for so many years, there is an air of abstraction; a seriousness as of long and careful meditation, as they meet and ask each other which nomenclature they intend to follow, that of Smith or that of Dyar? The fact is, modern entomological nomenclature has become more literary than scientific, but if it could only be placed where it properly belongs and kept there until the really scientific results could be separated from the enveloping obscurity, it would be a decided advantage. The trouble at present is not that all systematic entomologists are failing to do good substantial work, because this is not true, but the difficulty lies in what seems to have come to be an unwritten law, that we must accept and immediately adopt, the latest

revision, regardless of its merits or whether or not it is as good, better or worse than the one we are already following. It is doubtful if names that have been in general use for 20 years or over, and still continue to enable us by their use to indicate clearly and explicitly certain insects, ought to be changed, so long as this condition obtains and science is not injuriously affected thereby. We cannot, for illustration, have two species of the same name in the same genus, neither can we have two genera of the same name, but it seems to me that common sense ought to figure in science as well as in other things, and as between two names the one retained that will best fulfill its mission. In fact, after all has been said, our troubles are largely of our own making and due to our own stupidity. We cling tenaciously to our laws of priority, and yet accept, instantly, the statement of anyone who choses to revise a genus, group or family. Can there be two courses of action more diametrically opposite to each other? The trouble is not that there is too much activity, but in over-publication, based on under-investigation, and the premature acceptance of results so obtained. You may call it a case of chronic entomological indigestion, if you please, and any sort of indigestion makes cranky men. No one wishes to banish the systematists, or curtail their labors, but there are many of us who want to see the results tried, or at least tested, before being compelled to accept them. We want the acceptance to be based on actual merit and not on the fact that they are the freshest from the printer. The economic entomologist and the morphologist are fully justified in refusing to accept, at once, changes in nomenclature that are not based on actual rearings, except in cases where the change is so plainly demanded as to leave no reasonable doubt of its validity. If there was more conservatism in the acceptance of changes in nomenclature, there would be less hasty work done and less premature statements published. As it is, an instructor in entomology may take his class to the woods in the forenoon and show his pupils a species, which he calls by name, and inform them that he will expect them to render an account of their observations, giving the name thereof in class the following morning; but,

when morning comes and he receives his mail, he is astounded to learn that he has just time to revise his nomenclature, and is obliged to inform his pupils that what was one species yesterday is another to-day, and escape explanations the best he can. He may finish his lecture for the next day very late at night and find that he must revise it before going to his class in the morning. In fact, if this thing keeps on and he is a very deliberate speaker, and the name of the species a very long one, he may be caught in the midst of it, in mid-air so to speak, in order to meet the very latest literary revision in a most unnatural nomenclature.

With the morphologist, genera and species imply relationships, to him of the greatest importance, but if these are to be continually shifted about, retired and again regenerated to suit the mind of the individual systematists, how is he to make any progress in his investigations? Again, if the worker in applied entomology, or the morphologist, puts forth a new fact, it is accepted on probation and must wait until it has been further tested before final acceptation, while the opinion of the systematist jumps at once into rank as an authority. Why so much precipitation in the one case and not in the other? Why precipitation at all? The lexicographer will admit new words only after they have been shown to be necessary, in order to express certain thoughts or ideas, or to indicate certain objects. Why not apply this plan to innovations in entomological nomenclature? In other words, apply the same rules in regard to discoveries in nomenclature that we do to similar discoveries in other lines of research; adopt after proof of correctness and not before.

Old laws and regulations have inevitably to be amended or modified, in order to meet changed conditions and requirements, and it is one of the most infallible indications of human progress in jurisprudence when those upon whom the duty devolves, rule more and more within the spirit and less and less in accordance with the mere letter of the law. No law of priority can be framed to meet every possible exegesis that will arise, but it would certainly seem that the laws of priority in entomology might be advantageously modified, and then

broadly applied, in a manner to remove at least some of the present unsatisfactory features. At present there is altogether too much in systematic work left to the opinion of the individual, a condition that has never proven for the best in any of the affairs of human life. An individual may be sincerity and honesty itself, yet be in the wrong, and with far more frequency than would a comparatively small body, with a wider range of experience and opinions.

An Early Collector in California.

By Fordyce Grinnell, Palo Alto, Cal.

Pierre Joseph Michel Lorquin was born in Valenciennes, Northern France, about the year 1800. He entered the University of Douay, graduating with honors, when he entered a notary's office as first clerk and rose steadily until he obtained papers which entitled him to practice his profession. In 1840 he removed to Paris where he was referee in the High Tribunal: this was a high office at that time, and the occupant was of considerable importance. In 1848 the Revolution broke out and Lorquin applied for a position in Algiers: he obtained this and took up his residence at that place; this was his first most important voyage, and here he collected a great amount of valuable and interesting lepidopterological material.

Hearing of the discovery of gold in California in 1850, he relinquished his position and set out for the new El Dorado; but gold was not first in his mind, it was the thought of the virgin field he would be the first to explore scientifically, and the number of new things he would be sure to get. He arrived in 1850 and started for the mines in Tuolumne County, probably no doubt to practice his profession as a lawyer, as there was plenty for lawyers to do in those days of '49. Here he began his collections. He sent for his family, and they arriving in 1852, he set out for a tour of the northern part of California; from Sacramento he went to Downieville, Plumas County, Eldorado County, Stockton and Carson City, Nevada. His excursions were continued in the South where he visited Los Angeles and San Diego. At the latter place he obtained

Lycæna regia or *sonorensis*. On account of his son's health, he returned to San Francisco. The next year, 1854, he started on another excursion northward and visited Monte Cristo in Sierra County, Yuba River, Amador County, Calaveras County, Mariposa County, south to Fresno County, and north to Marin County and Sonoma County till 1856. In the latter year, he started out for Manilla, Philippine Islands, but came back again in 1861, when he remained one year. In 1862, he left for Cochin China and visited the following places in turn, always collecting Lepidoptera :—Hong Kong, China, several islands of the Philippine group, Celebes, Aru Islands, Ceram, Amboyna, Ternate, Gilolo and Java. In the latter place he had an attack of fever which compelled him to remain in a hospital for some time. When he recovered, he returned in 1870 to Paris. He travelled a little in Southern France and Spain collecting butterflies and moths. He had prepared to return to the Philippines again but died only a few days before he was to start in 1877.

Mr. Lorquin was a medium sized man, and had a very strong constitution which enabled him to travel everywhere in search of specimens, always on foot. He was a great pedestrian, being able to walk long distances without being fatigued. In his travels in the East Indies, he lived with the natives by whom he was much helped in his travels and collecting.

Mr. Lorquin is an important character in California Entomology, as almost all the Lepidoptera described from the Pacific Coast by Boisduval were collected by this man. Dr. Boisduval was Lorquin's family physician.

In 1852, Dr. Herman Behr and Mr. Lorquin met in San Francisco and from that time were close friends. Dr. Boisduval always sent a specimen of each species when he described it back to Lorquin and these co-types were turned over to Dr. Behr and are now preserved in the museum of the California Academy of Sciences. Lorquin also collected other insects, especially beetles, and one, a cerambycid, is called *Calloides lorquinii*.

Mr. Lorquin never learned English well enough to converse very intelligently in it; just before he set out for the Philippines he told Dr. Behr that it was a shame that he was just on the point of learning English and now he had to drop the project.

Pierre Joseph Michel Lorquin holds a unique position in California Entomology as the discoverer of so many of our species, and will always be thought of in connection with that noted group of California students of the Lepidoptera—Behr, Behrens, Stretch, Henry Edwards and Rivers.

I am indepted to Mr. E. F. Lorquin of San Francisco for these particulars in regard to his father's life.

Some Notes Chiefly on the Scarcity of Michigan Rhopalocera in 1903.

By W. W. Newcomb, M.D.

Considering the editorial in the last October News, and my own experience during the collecting season of 1903, I have expected to find some interesting comments in the entomological journals on the scarcity of butterflies and other insects. Up to the present time (April, 1904) little has appeared, but I am informed that the unusual weather conditions of 1903 have not been confined to this region alone. Undoubtedly also the preceding wet cold summer (1902) affected the butterflies last season.

The essential weather features in 1903 were as follows: spring began early with unusual warmth, and both March and April were advanced for the season. Almost a summer temperature (70°) occured on March 18th. Towards the middle of May it was abnormally hot and dry, but at the end of that month it became very wet. June and July for the most part were wet and cold, and cut down the number of days when outdoor observations could be made. August and September were more nearly normal for those months, except that they were too cold.

The scarcity of Rhopalocera was not alone in numbers, but also in varieties. On July 6th twenty-three species were seen, the greatest number on any one day throughout the season. On the other hand, I have walked miles to bring home hardly a half dozen desirable specimens and to see not twice as many kinds. In fact, one could consider himself lucky if he saw seventeen or eighteen varieties in one day.

Such species as *D. plexippus*, *A. bellona*, *P. tharos*, *G. inter-*

rogationis, *G. comma*, *G. progne*, *V. antiopa*, *P. atalanta*, *P. huntera*, *L. archippus*, *N. canthus*, *N. eurytris*, *S. alope*, *C. thoe*, *L. pseudargiolus*, *L. comyntas*, *P. rapæ* and *C. philodice*, were, perhaps, little, if any, affected. On the contrary many others certainly were. In the beginning of its appearance at the end of June, *A. cybele*, while not rare, was considerably less abundant; a few specimens were seen up to as late as September 6th. *A. aphrodite* was decidedly scarcer, while not one specimen was seen of *A. myrina*, a species ordinarily appearing in moderate numbers. A few examples of *P. cardui*, which is not common, were found, and two or three specimens of *L. ursula*, also uncommon here, were reported. *T. edwardsii*, *T. calanus*, *T. titus* and *C. hypophleas* were scarce in comparison with other years. The *Papilios: polyxenes*, *troilus*, *turnus* and *cresphontes* were also in fewer numbers. The larvæ of the last named species were fairly common on prickly ash in September and October, but were not so abundant as in some years. The Hesperidæ especially were scarce, and whereas in other seasons many appeared, few were to be seen of such common kinds as *P. cernes*, *P. peckius*, *P. hobomok*, etc., and even the numbers of the little *A. numitor* were somewhat restricted. The only members of this family at all common were some of the *Nisoniades* early in the season—*E. pylades* and *E. tityrus*. None of the rarities here, *A. idalia*, *M. harrisii*, *P. nycteis*, *G. j-album*, *V. milberti* or *P. philenor*, appeared at all. The observations made above are for Detroit. In Oakland County, 25 or 30 miles northwest of Detroit, two or three specimens each of *A. myrina* and *P. nycteis* were reported. *L. ursula* is also more common there, and I saw six—four in July and two on September 14th.

If, however, the usual numbers failed to appear there was some compensation in finding five species whose presence was previously unknown to me, although I have been more or less familiar with the butterflies in this vicinity for fifteen years. The first surprise was on May 12th, when three specimens of *Thecla irus* var. *arsace* were taken. They were flying at the edge of an oak woods bordering a road and alighted on some low vegetation where they were easily caught. A return to the

same spot three and again nine days later failed to show any others, except possibly one uncaught suspect. On July 3rd, a male of *Pamphila dion* was taken, and on the 6th two others, a male and a female. These large handsome *Pamphilas* were found adjacent to a marsh. On July 12th, at Clarkston (Oakland County), I found one somewhat worn *Eudamus bathyllus*, the third addition to the list. The form invariably found at Detroit has been *pylades*. On July 13th, also at Clarkston, I saw fluttering above some grass and clover a small yellow butterfly which I supposed was a dwarfed *C. philodice* until it was caught. It proved to be *Terias lisa*. On September 1st, a second specimen was taken in Detroit, and on September 21st, a third one at Clarkston. Two others were also taken in Detroit, but not by myself. The fifth addition was *Junonia cœnia*, which personally I have never been fortunate enough to observe here. One was reported to me as caught on August 10th, others were seen about the same day and still another was observed on October 4th, but, although I searched diligently for them in August, I could discover none.

Of further interest was the discovery of a locality where, in a favorable summer, *Melitæa phæton* promises to be abundant. Heretofore, I have seen only three specimens which were taken in separate years. This season I caught nine and saw several others. I would mention also finding one larva of *P. ajax*, the first one known to me to be taken here. Pawpaw is found in small patches in only a few localities near Detroit, but, nevertheless I usually see a limited number of *ajax* butterflies every summer; this year about ten. When in Ann Arbor a few years ago, the month of May usually showed a few of the butterflies. Doubtless this region (Detroit, Ann Arbor) is close to the northern range of *ajax*, probably only because the pawpaw does not extend farther northward.

It must not be presumed that I consider the cold, wet weather as accounting for the finding of the additional species. Rather it is due to seeking new localities and to more frequent and persistent hunting when there seemed to be little to reward one's efforts, perhaps one advantage of an unfavorable season. It seems strange, however, that the presence of *T. lisa* should not have been brought to my notice before, but I have specimens of *C. philodice*, for which as far as size is concerned could easily be mistaken for it. Again, it is interesting that the only *J. cœnia* caught was by a beginner. Doubtless another summer will show still other species not previously observed, and I am looking for additions, especially among the Hesperidæ and the *Theclas* and possibly some southern strays.

Micro-Lepidoptera—Suggestions.

By W. D. Kearfott.

(Continued from p. 169, Vol. xv, No. 5.)

Part III.—Breeding (continued).

Common jelly-glasses, with tight tin covers, make very good breeding-jars for the house. I also use several sizes of screw-top jars of the style as shown by Fig. 18. They are made in a number of sizes ranging from small ones of an ounce capacity up to large ones about six inches tall by three inches inches in diameter. The particular advantage of both the common jelly-glasses and the screw-top jars is that they have no inside ribs or ledges to gather dirt or for the larvæ to spin their food-plant to and prevent its easy removal for cleaning, etc.

Fig. 18.

For convenience of handling, a few shallow trays should be made, just wide enough to hold a glass or jar, and about twelve or fifteen inches long. For the longer vials (Fig. 17), racks such as are used for holding rows of test-tubes are very convenient.

It is well to go over the material collected as soon as possible after returning from a trip, taking one vial or box at a time and carefully drawing out with forceps the small clusters of leaves that may have been packed in too tightly for comfort, and placing them in a jar of suitable size, so that the contents will not more than half fill it. Then write on a slip of paper date, place and food-plant; use pencil always, the dampness will make an undecipherable blot of ink. Leaves of firm texture, such as those of the hardwood trees, can be closed up tight without danger of sweating or mold, but some of the

softer leaves, especially of succulent annual weeds, are apt to get too wet; and if drops of water are observed on the inside of the glass, remove the tin cover and close the top with a piece of cheese-cloth held on by a rubber band. A day or two of drying out is sufficient-

Each jar should be examined every day, both for the purpose of seeing if any moths have emerged and to see that the condition of the larvæ is healthy,—in other words clean. After a very little experience, it will be easy to observe when the food is becoming stale or soggy or that too much dampness is accumulating on the leaves or bottom of jar, all of which will lead to mold and sickness. Then the larvæ must be changed to entirely fresh food and a clean jar. Select a duplicate of the one they were in and place in it a moderate quantity of the food-plant; then dump out the contents of the old jar on a large sheet of clean paper, and with fine forceps carefully examine every fragment, picking up each larva delicately with the forceps,—which will not hurt him if not squeezed too tightly,—and drop him on the leaves in the fresh jar. Should any pupæ be found, it will be better to place them in a separate jar or vial, where they need not be disturbed again; but be sure and write a duplicate label, so that the identity will not be lost.

The great majority of the larvæ taken in the early part of the summer, up to the middle of July, will emerge as moths within one to three weeks after transforming to pupæ. Some of those taken later than this will live as larvæ or pupæ all winter; and species hibernating in this state must be kept out-of-doors under as nearly natural conditions as possible.

I have left to the end the subject of making notes and recording observations of all larvæ that are bred, as it is really the most useful and important part of the whole work. The life-histories and habits of our North American species of Micro-Lepidoptera are so little known that up to this time less than twenty per cent. have been described. So this field is one of the easiest in nature in which a collector just starting can find lots of room for original work.

My method is as follows:—On the slip of paper in each jar I write a number, and in a note-book (card index cards are bet-

ter) record the same number at the top of the page or card, with date and place and name or description of food-plant; if the latter is unknown, press a piece and send to your nearest botanical friend for determination; with your breeding number on the label.

Then on the card make a description as full as possible of the larva, noting shape, color, stripes and spots on the body, color and spots (if any) on head, thoracic shield and legs. State its habits, whether it crumples, folds or curls leaf, or lives in stems or fruit, and anything that seems interesting about it.

If you can observe date of pupation, make record of it and, of course, when moth emerges do the same.

Put this same number on everything that issues from this particular jar. There will be Dipterous and Hymenopterous parasites; it is just as likely that they are unknown, or at least have never been bred, so your record of their "hosts" will be of value. The pupa and cocoon should also be preserved, and if a sample of the twisted leaf, etc., can be saved, both should bear the same breeding number. It is well to put the initial of your name in front of this series of numbers, as K. 427, to distinguish your bred material from other specimens in your collection that may happen to have miscellaneous numbers on them.

It may not be well to undertake too much at once; but after

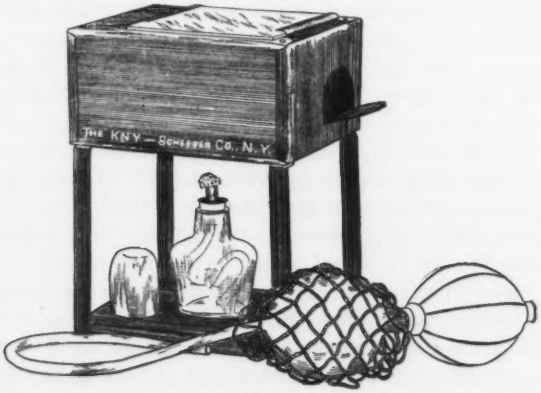


Fig. 19.

this work is well started, you will want to preserve a specimen of each different kind of larva. Any method of preserving in liquids is objectionable, owing to difficulty of taking care of numberless bottles and the great trouble of studying the specimen so enclosed. I use an ordinary larva-inflating oven and apparatus, the same as is used for large caterpillars, and as shown by Fig. 19. The only difference in blowing large or small ones is that, for the little ones, the glass tubes must be pulled out to a very fine point. When ready to inflate, I take the alcohol lamp from under the oven and place it before me on the desk and, holding a glass tube by both ends, heat the middle of it in the lamp-flame; when, and not until, it is a dull red, I give both ends a quick pull, which leaves two very fine hair-like points; repeat this until you have enough. Place the lamp back under the oven, so that it will be warmed up for the next operation.

Then pick up a larva and drop him for a moment in a tiny glass of alcohol, and as soon as he is motionless, lift him up and lay on end of forefinger of left hand, with anal end up; then very gently, with thumb or pencil, squeeze the contents through the anal opening; a sharp knife to scrape this away as fast as it appears will prevent discoloring the skin.

Still holding the deflated skin between thumb and forefinger of left hand, pick up a glass tube, wet the point to prevent sticking, and carefully insert in anal opening. Then for a second or two hold in the oven, which will cause the skin to stick fast to the tube. Then stick the big end of the glass tube in the rubber tube connecting to the double bulb, and give the latter the least bit of a squeeze, and if everything has been properly done, the skin of the larva will spring out rounded and full size. Then, still keeping up light pressure on bulb, place in oven for a minute or two, until the skin is hard.

With a pair of sharp scissors, snip off the glass tube about a sixteenth to an eighth of an inch behind the larva.

To mount, draw a number six pin through a small block of cork about a quarter of an inch square, then at right angles to the big pin stick a Minutien-Nadln through until the point comes out the other side a quarter of an inch or more. Touch the point of the Minutien-Nadln with thin shellac and care-

fully raise the larva and stick the point in broken-off end of glass tube. Label with usual locality label and breeding number. Of course, the same tube can be used many times, by holding the broken tips of two over the flame together, which will fuse them; let them cool a moment, and then heat a little back from the junction and draw out a new point.

As soon as the name of the bred specimen can be obtained, it should be written on the card, containing its life-history, and from time to time the facts should be published. The Editor of the NEWS is hungry for just such original notes. My services are freely offered here as elsewhere, and if any collectors care to send me, in the fall after the breeding season is over, their notes and specimens, it will be a pleasure to identify the latter and put the former into shape for the printer, of course, giving full credit to the collector.

The space limitations prohibit a very elaborate explanation of every detail of the work which has been outlined in a general way in this series of articles, and naturally some essential points have been overlooked; for instance, the proper height at which the insects should be placed on the pins, which, in the case of Kirby No. 1 pins, should be at such a height that three-quarters to seven-eighths of an inch of the pin is below the thorax. This will make the plane or flat surfaces of the wings, when spread, about one inch above the point of the pin. Minutien-Nadln should be stuck clear through the thorax, leaving only about an eighth of an inch of the head or blunt end above it,—just enough to grasp with the forceps; this will leave the greater part below the insect, where all the length possible is required for pinning on setting-boards and through the double mount. Mr. Merrick calls my attention to this omission, and also adds that the tin portable moth trays, made from his plans, should be rivetted together and not soldered. Experience with solder on several occasions was disastrous.

As the majority of the readers of this are well aware, Mr. Merrick has a large heart and kindly disposition; hence, anyone wanting to know more about the traps of his invention will receive full advice and direction by addressing him.

My collection of all of the families of Micro-Lepidoptera is

very complete and well worked up; in fact, some groups contain a larger proportion of named species than any other collection in North America; hence I am always willing and glad to name small or large lots of specimens for new or old correspondents, and invite correspondence from any and every one who may be or who may become interested in this very fascinating study, and advice or assistance can always be had for the asking, both in regard to the collecting and rearing, as briefly discussed in these papers, and as well the identifying of specimens.

The electrotypes of Figs. 17 and 18 were loaned by Messrs. Whitall, Tatum & Co., and of Fig. 19 by the Kny-Scheerer Co. All of the special apparatus referred to in these Suggestions can be purchased at reasonable prices from the dealers who advertise in the NEWS.

On Ropronia garmani Ashm.

By J. CHESTER BRADLEY, Ithaca, N. Y.

(With Plate XIV.)

As no species of this anomalous and highly interesting genus has been figured, I thought that a figure of the undescribed female of *R. garmani* might prove of considerable interest to those who have not been fortunate enough to see actual specimens. The genus was originally described by Provancher from *R. pediculata*, ♀. It has been variously placed in the Evaniidæ, Braconidæ, etc., and now Dr. Ashmead places it in the subfamily Monomachinæ of the family Heloridæ, thus allying it with the equally anomalous European genus *Monomachus*. This is probably the nearly correct position, although the ovipositor in my specimen does not seem at all that of a Proctotrypoid insect. Provancher originally placed the genus among the Braconidæ, but later transferred it to the Helorinæ, The general appearance is like that of an *Evania*, for which a person could readily mistake it, as I did, in the field. The insertion of the abdomen between and slightly above the coxæ quickly undeceives one, however. As the female is undescribed, I append a description in full. There are three species which have been treated in a paper on the genus in the Proc. Entom. Soc. of Washington, iv, p. 132. Dr. Ashmead, in his "Clas-

ROPRONIA GARMANI ASHMEAD.

sification of the Proctotrypoidea," Journ. N. Y. Ent. Soc., x, p. 243, Dec. 1902, states that the claws of *Monomachinæ* are simple, using this character with others to separate them from the *Helorinæ*. My specimen, however, has the claws pectinate. Dr. Ashmead, at my request, kindly re-examined his specimen and found that the posterior claws had two small teeth beneath, the others being apparently simple. As the claws are very small and the teeth quite difficult to detect, it is probable, however, that they are all really pectinate, as in my specimen. Dr. Ashmead also informs me that the spelling *Roptronia* used in his paper is an error.

The photograph of the insect was very kindly made for me by Prof. M. V. Slingerland.

Ropronia garmani Ashmead.

♀.—Entirely black except front and middle tibiæ and tarsi. Head, seen from above, transversely quadrate; cheeks broad; mandibles bidentate, the inner lobe much the longer; clypeus broadly transverse, the anterior margin rounded, slightly and very broadly marginate; antennæ inserted in the centre of the frons, in a depression between the prominent eyes, the distance between the bases of the antennæ approximately equal to the distance between the base of each antennæ and its corresponding eye; thirteen joints are present in the specimen, but the apical one or two are broken off, so that there should be fourteen or fifteen, the scape is considerably shorter than the third joint; the antennæ are thickened toward the apex of the third joint and taper to their apex; the three ocelli are placed close together in the centre of the vertex, two on a line and the third in the centre and front; head entirely covered with a griseous pubescence, longer on the cheeks and front, close-cropped and scarcely noticeable on the vertex; antennæ clothed rather thickly with brown hairs; mandibles clothed with white hairs, punctate; clypeus and frons coarsely punctate; vertex evenly and finely punctate in front, transversely wrinkled behind the ocelli. Neck short, so that head is borne in juxtaposition to the thorax. Thorax narrower than the head; pronotum restricted to a narrow bar in front and extending laterally to the tegulæ, a prominent ridge separating it in front from the pleura which extend around and meet each other in front of and at right angles with the pronotum; mesonotum well developed, the parapsidal grooves deeply impressed; scutellum and post-scutellum well developed, the the latter but slightly shorter than the former; each axilla produced into a lateral projecting tooth, prominent as seen from in front; propodium tapering convexly to the insertion of the petiole; sides of thorax irregularly subreticulated with a smooth patch on the mesopleura; pro- and meso-notum evenly punctured, posterior dorsal sclerites more roughly

reticulated; entire thorax more or less sparingly griseo-pubescent. Wings hyaline, nervures brown; arrangement of nerves as shown in the figure in fore wing; the hind wing acute at apex and without a separate anal lobe, anal furrow well marked; costal and subcostal nervures distinct but closely parallel, forming, especially toward the point where they finally coalesce, just before the hooks of the wing, a distinct though very narrow costal cell, which may be turned over so as to be indistinguishable from a side view; the only other nervure, arising beyond the base of the subcosta, bifurcating shortly beyond its origin and extending each fork to the margin, is shown in the figure. The tarsi and more or less of the tibiæ of the front and middle legs are yellow, the rest black; posterior and middle tibiæ with two apical spurs; tarsi five-jointed; claws with three distinct pectinations beneath. Petiole two-thirds the length of the thorax; abdomen highly compressed laterally; the second joint very large, longer than the petiole, remaining joints short, all of them together less than the second joint; abdomen smooth and highly polished, the apical margin of each joint finely punctured; ovipositor short, straight, or curved slightly dorsad, and exserted from a distinctly ventral position, pointing dorsad. The ventral and dorsal segments of the abdomen appear of approximately equal size from a lateral view. Length 9 mm.

The writer took one female, July 1, 1903, at Cobb's Creek, Delaware Co., Pa. It is now in his own collection.

New Forms of Exotic Papilionidae.

By Georgr A. Ehrman, Pittsburg, Pa.

While rearranging my collection of Papilionidæ, which consists of nearly three thousand specimens from all parts of the world, I find a few representatives that are new to science, and which will be, I am glad to say, of much interest to the student who finds as much beauty in the exotics as some of our entomologists do in our native species.

Ornithoptera ritsemæ Snell., n. var. **tantalus.**

Male.—An extreme form of *O. ritsemæ*; the upper side of the apical parts of the forewings is much more suffused with yellowish rays than is found in the typical form of this sex of this species. The hind wings have in the submedian space in each cell (the cell between the costal and subcostal nervures being excepted) a large, elongated, black-suffused spot, and the crimson collar is absent; these three points of difference make this form very conspicuous.

This interesting form was collected by Herr John Watersttadt in the German possessions of North Borneo, and through whose

untiring energy the writer is indebted for much material from that part of the world.

Habitat, Kala Bula Hills, N. Borneo. Type, Ehrmann Coll.

Ornithoptera cambyses n. sp.

Male.—Allied to *O. darius* Gray; but the forewings are more falcate at the apex than in that species, and the hindwings have a more delicate yellow color (similar to *O. andromache* Staud.), and in each cell there is a small, black, oval spot 4 mm. in diameter; this row of spots is on the submarginal inner space, and gives to this species a very odd appearance.

I received this species some time ago from a Mr. Knechtel, who had received it in a small sending from a friend who resided at Columbo, Ceylon.

Habitat, Columbo, Ceylon. Type, Ehrmann Collection.

Papilio klagesi n. sp.

Female.—Upper side of head, thorax, body and antennæ are smoky black. Forewings, the outer half is semi-transparent, becoming more opaque toward the outer margin; the inner or basal half is deep velvety black; on the fascia between veins one and three is a white quadrate-shaped spot, one-eighth inch wide and three-sixteenths of an inch long. Hind wings are of a uniform deep velvety black; there is a row of five bright pinkish spots in the middle area extending from the abdominal margin to the apex, the first beginning at the abdominal margin is triangulate, the second and third are oblong, the second being the longest, one-eighth by one-sixteenth of an inch in size. Spots four and five are almost round, spot four is one-sixteenth of an inch in diameter, while number five is but one-thirty-second of an inch in diameter, dentations obscure.

Underside—There is a small red spot on the prothorax and three very faint spots of the same color near the base of the wings, the two segments nearest the thorax have also slight indications of a red spot on each side of them; the legs are black, all wings the same as above but of a lighter shade. Expansion, one and four-fifths inches.

This very interesting species of Papilio I consider of great importance, as it shows a transition between the *echelus* Hubn. and *chabrias* Hew. groups, and up to the present time it is the smallest species known. This little creature was discovered by Mr. Edw. A. Klages at Suapure, Venezuela, South America, and seemed of the greatest rarity, as the writer has been informed by that gentleman that he saw but two examples during his whole sojourn in the tropics. Type in Ehrmann Coll.

Thaumatoneura Again (Odonata).

By PHILIP P. CALVERT.

Mr. F. D. Godman has recently acquired for the *Biologia Centrali-Americana* six males of this genus, taken at Carrillo, Costa Rica, by Mr. C. F. Underwood. Four are *T. inopinata* McLachlan, two are new as follows:

Wings with a black or dark brown band for their entire width, from the nodus or (even a little proximal thereto) to more than halfway to the pterostigma; no transverse pale citron band on frons or nasus . . . . . *inopinata.*

Wings uncolored; a transverse pale citron band on nasus and on frons connecting the yellow genal spots . . . . . **pellucida** n. sp.

Pellucida does not differ in the appendages, nor do the uncolored wings indicate a mere age-difference, for not only is no trace of a dark band visible, but both individuals are pruinose on head, thorax, base and apex of abdomen. Mid-dorsal thoracic carina yellow, abdominal segments 3–5 largely brown. Abdomen 56.5–58, has wing 47 mm.

Inopinata also has the mid-dorsal thoracic carina yellow (this part of the thorax was damaged in the type). Three males, with pruinose on pectus and apex of abdomen, have 3–5 brown in basal four-fifths, black in apical fifth and narrowly at base; remaining male with 3–5 all black. Width and contours of black bands on wings variable. Abdomen 58–59, hind wing 47–49 mm.

In all six males.—Antenodals on front wings 3, except 4 on left side of one *pellucida;* on hind wings 3, except 2 on right side of one *inopinata*, 4 on left side of one *inopinata* and on right side of one *pellucida*. Quadrilateral free, except for a single crossvein on right hind wing of one *inopinata*. Two submedian crossveins, except 3 (2 of them under quadrilateral) on right hind wing of one *inopinata*. Subnodal sector begins (*a*) proximal to nodus on left hind wing of one *inopinata* and left front wing of one *pellucida;* (*b*) at nodus in four hind wings (two asymmetrical) of *inopinata*, and right front and right hind wings of one *pellucida;* (*c*) distal to nodus on all front wings (eight) and three hind wings (asymmetrical) of *inopinata*, on all four wings of one *pellucida* and on left hind wing of the other *pellucida*.

Bibliography.—McLachlan, Ent. Mo. Mag. (2) viii, pp. 130-131, 1897. Calvert, *l. c.*, xiii, pp. 29-32, 1902; Biol. Cent. Am. Neur., p. 58, pl. iii, figs. 16, 21, 27, 1901.

New Meloidae from Arizona.

By Henry Skinner.

Calospasta wenzeli n. sp.—Head red, oval, smooth, median line feebly impressed, antennæ black; thorax longer than wide, narrowed anteriorly; elytra rich metallic shining blue or green, as individuals differ in color, clothed with rather long white hairs; legs red; abdomen red, with ventral surface green or blue. Length 7-10 mm.

This handsome species is very different from any of the known forms and is the only species having the head and thorax concolorous, except *mirabilis* Horn. It is named after that unsurpassed collector and master of technic, Mr. H. W. Wenzel. Numerous specimens were taken at Florence, Ariz., August 10, 1903, by C. R. Biederman.

Type in collection Acad. Nat. Sci. Phila.

Epicauta abadona n. sp.—Head immaculate, ferruginous; abdomen, legs and elytra rufo-testaceous; thorax with an olive green spot, rather obscure, and two parallel lines which are produced by the absence of pubescence; three narrow, dark brown vittæ, the one nearest the margin almost obsolete. Length 11-15 mm.

This species comes nearest to *lemniscata* Fabr., but differs from it in color, the narrower vittæ with one nearly obsolete and the immaculate shining reddish head.

Phoenix and Tucson, Arizona.

Type in collection Am. Ent. Soc.

Epicauta alastor n. sp.—Head, thorax, elytra, abdomen, femora and tibiæ mouse-color; antennæ and tarsi reddish brown; there is a very narrow dove-colored line running the length of the elytra midway between the suture and the margin; the margin and suture are narrowly edged by the same color. Length 12-16 mm.

This species also resembles *lemniscata* and *vittata*. Numerous specimens were received from C. R. Biederman, taken at Florence, Arizona, August 10, 1903.

We also have specimens from Yuma and Phoenix.

Type in collection Acad. Nat. Sci. Phila.

Dr. Henry Skinner.—If I may be granted preemption in the Parnidæ, and you will so signify under "Notes and News," I shall be grateful. Material from the southern and western sections of the U. S. is especially desired.—Wm. D. Richardson, P. O. Box 185, Fredericksburg, Va.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

To Contributors.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

PHILADELPHIA, PA., JUNE, 1904.

The following has been received from Mr. Merrick, and the matter is of considerable importance to those active in exchanging. We trust that those interested will promptly reply, so that the result may be published in the NEWS.

"I do not know how my suggestion will be received by the fraternity of bugdom, but as it appears to me to be a matter of some importance, will risk a statement of it, in hopes it may result in some good to all of us. In view of the fact that we have two new check-lists, differing very materially and published almost simultaneously, and also the fact that some have arranged their collection in accord with one, and some with the other, and further in view of the fact that 'exchanges' are almost exclusively made by the use of check-list numbers, can not some plan be devised by which we can all use the same list for our exchange numbers?

"I have been the recipient of list-numbers during the past winter as per Smith 1891, Smith 1903, and Dyar 1903. In two of the three cases I found it quite a complicated and tedious matter to translate them into my list of numbers. As each one has preferred to use the numbers he has adopted, and this would accomplish no reform, could we not all agree to adopt the list for exchanging that is now used by the greatest number?

"The collecting season is about to open (let us hope and pray), and next fall, when we are arranging our duplicates, would be an excellent time to make the change to uniformity.

"Let us all vote by postal card as to his or her choice of lists, and the minority change their exchange numbers to accord with the majority. The votes may be sent to our worthy Editor or, if leisure does not serve in his case, the writer* will gladly receive and tabulate them and publish the result through the NEWS. This does not require any resetting of our collections, which would meet with most decided opposition, but simply uniformity of exchange numbers. Respectfully submitted 'for the good of the order.' What say 'you all?' Let us have an expression of opinion."—FRANK A. MERRICK.

*Please send replies to Mr. F. A. Merrick, 1453 Third Ave., New Brighton, Pa.

Entomological Literature.

HARRIMAN ALASKA EXPEDITION. Vols viii and ix. Insects, Parts one and two. New York, Doubleday, Page & Company, 1904.

These two sumptuous volumes are parts of a series describing the Harriman Expedition to Alaska. The work is edited by C. Hart Merriam. The insects were collected by Prof. Trevor Kincaid of the University of Washington at Seattle, who was entomologist to the expedition. The material collected was sent to various specialists to be studied and reported on, as follows: Arachnida, Nathan Banks; Myriapoda, O. F. Cook; Apterygota, J. W. Folsom; Orthoptera, A. N. Caudell; Aphididæ, Theo. Pergande; Homoptera, W. H. Ashmead; Heteroptera, O. Heidemann; Odonata, R. P. Currie; Neuropteroid Insects, Nathan Banks; Coleoptera, E. A. Schwarz; Metamorphoses of Alaska Coleoptera, Trevor Kincaid; Lepidoptera, H. G. Dyar; Diptera, D. W. Coquillett; Tenthredinoidea, Trevor Kincaid; Sphegoidea, Trevor Kincaid; Formicidæ. Theo. Pergande; Hymenoptera, W. H. Ashmead. These volumes represent a fine piece of bookmaking and a splendid piece of faunal work. They lay the foundation for the future in regard to Alaska insects. One of the first things that attract attention is the phenomenal work done by Prof. Kincaid in a comparatively short time. His studies in the metamorphoses of Coleoptera also makes a most valuable contribution to an important but little investigated subject. Dr. Ashmead's paper on the Hymenoptera is also an important one, two hundred and thirty-seven new species being made known. Sixty-three new species of Diptera were described by Mr. Coquillett. Mr. Harriman has done a noble work for science in fitting out the expedition and making known so much of interest about a comparatively little explored country. This fine work will undoubtedly stimulate a great interest in the entomology of Alaska.—H. S.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

THE NEWS is not published for July or August.

MR. KEARFOTT'S method of using a test-tube for killing Micro-Lepidoptera (described in April NEWS) suggests to me that a description of my poison-tubes may be valuable. I use what is known as a tube-vial, made of clear white glass, with flat bottom, without neck and for a cork stopper. The latter is perfectly tight and handier than a screw-top. A convenient size is 60 mm. in height and 23 mm. in diameter. I also employ a few larger tubes, 75 mm. in height and 25 mm. in diameter, and for the Tineidæ a smaller tube than 23 mm. in diameter can be used. I usually carry eight of these tubes into the field with me, and for convenience in carrying I have made what might be termed a tube-case. I make

this as follows: I take an old handkerchief and cut two strips, in width the length of a tube. Between these strips I sew a thin layer of cotton and then cover each tube with the strips so as to form a cylinder, in and out of which the tube can be easily drawn. I close the bottom of the cylinder by turning in a little of the strips and securing with a few stitches. I sew four (a convenient number) of the cylinders together side by side in a row. I then cover the whole, except the top where the tubes are removed, by a piece of brown denim. The top of the tube-case comes to within about three-eighths of an inch of the tops of the tubes, thus with the addition of the part of the corks above the tubes, there is given ample room to grasp the tubes in removing or replacing the same. The advantages of this arrangement are that four tubes instead of one can be kept in the same side coat or hip pocket as desired; the waste space of a long test-tube is avoided, and any one of the four tubes is at hand when needed. One can have as many tube-cases as he desires and they may be of different sizes for different sized tubes; I use at least three. In Detroit the physicians' supply houses do not keep them, but they can be obtained of Bausch and Lomb for about fifty cents a dozen, depending on the size. These tubes are charged with cyanide, and I have found them very convenient for taking Lycænidæ, many of the Hesperidæ and Geometridæ, Pyralidæ, etc. The same principle can be employed with larger tubes for Lepidoptera the size of Colias, Satyrus and a large number of Noctuidæ.—W. W. NEWCOMB, M. D.

A PALÆARCTIC NOTONECTA.—*Notonecta lutea* Müller has been heretofore known in the Old World only. It was described by this author in "Zoologia Dan. Prodromus," in 1776. This work is not known to me, so cannot give the type locality. F. X. Fieber, in his "Rhyncotographieen" (1851), states that it occurs in Sweden, Austria, and Bohemia, in Europe; and in Asia, gives Barnaul and Irtish in Siberia as localities. According to Kirkaldy, it occurs in Tammati, Finland, as well as in Bohemia and Siberia. In his "Synopsis Amphibicorisarum et Hydrocorisarum Fenniæ," 1875, p. 275, Prof. John Sahlberg comments on this waterbug as follows:

"Rather rare, but scattered all over Finland. I have found it farther north, near Sonostroff, in the southern part of Russian Finland (66°). Near Helsingfors it is rather common in clayey soils. It is distributed through Northern and Central Europe and Siberia."

However, what is most interesting in regard to *Notonecta lutea* is its distribution, and I now record it for the first time from America. It came to me with a number of other Notonectas from the Upper Columbia Valley, British Columbia. It is evident that we have here a true Palæarctic Hemipteron of wide distribution. The only other aquatic bug known to me to have a similar range is our common *Gerris* (*Limnoporus*) *rufoscutellatus*, which extends across Northern Europe and Siberia, and through British Columbia, down to Pennsylvania on the Atlantic coast.

Notonecta lutea Müll. is about the size and shape of *Notonecta irrorata* Uhler, but somewhat more convex in appearance, the dorsum being strongly arched. It approaches the latter bug also in the shape of the head and notocephalic outline. However, the entirely luteous color except in the costal margin of the corium, which has a dark strip, will at once distinguish it. In a paper in preparation will be given tables for separation of this insect and the other members of the genus.—J. R. DE LA TORRE BUENO, New York, N. Y.

I HAVE read with interest the comments and criticisms of Holland's Moth Book, and would like to add a few more of my own.

Plate xxiv, fig. 34, is *diffusa*, not *albilinea*. Pl. xxvi, figs. 8 and 9, should be reversed both in the reference to plate and also in the text. Fig. 5 of same plate is not *inquæsita*. It is *impecuniosa*.

Plate xxx, fig. 15, is most probably *erechtea* instead of *crassiuscula*, Plate xxii, figs. 23 and 26, represent ♀ and ♂ *Feltia volubilis*. This is all correct, only that, as the gray form is represented in one figure and the red-brown form in the other, it would give the novice the idea that the difference in color indicated the sex, which it does not, for I have both sexes in both colors. By the way, why has no varietal name been used to separate these very distinct forms? Hundreds of species much less worthy of such distinction have been named. Morrison, I believe, considered them to be distinct species, and named the dark form *stigmosa*. Why can't this be used to-day? They are as well marked and separate as any two forms that I know of.

On page 337 Holland perpetuates Dyar's singular mistake in making *Epelis faxonii* a synonym of *E. truncataria*. There seems no good reason for such a mistake, for the two species are not at all alike.

On page 132, I cannot accept without protest his lumping *Apantesis nais*, *vittata*, *phalerata* and *radians* as forms of one thing, and dropping the name *nais* entirely. I have never seen one of which I had any doubt as to its identity. He says he has bred all forms from the same larvæ. I don't believe he ever got moths with black costa from parents with yellow costa. The black costa separates *nais* at a glance when other marks fail.

I also do not believe that *Apantesis rectilinea* and *phyllira* are anything more than forms of one thing, and yet Holland, following Dyar's list, has placed such totally unlike things as *arge*, *achaia*, *virguncula*, etc., between them. They differ in nothing except in the presence or or absence of white veins in fore wings, and this is a very variable quantity, and with specimens enough I feel sure a complete gradation from one to the other could be shown.

There are many other minor errors of locality and orthography that I might mention, but this is already too long, so I will refrain from further comments.—E. J. SMITH, Natick, Mass.

TORTRICIDS OF NORTH AMERICA.—Will purchase large or small collections from all localities. Or will name and return promptly all known species, for privilege of retaining for study unknown species. Special object, publication of monographic work illustrating every species in color.—W. D. KEARFOTT, Montclair, N. J.

I NOTICE your plan regarding the announcements of work of special groups, and it strikes me as a very good one indeed. I may state that I have a synopsis of the Aradidæ for America north of Mexico in preparation and have in hand nearly all of the described species for this region. I would be glad to see specimens from different localities or receive locality records, and would be especially glad to see specimens of *Aradus ampliatus* Uhler, *abbas* Berg., *breviatus* Berg., *Aneurus politus* Say, *inconstans* Uhler, and *simplex* Uhler.—HERBERT OSBORN, Ohio State University, Columbus, Ohio.

THE infant son, two years old, of the famous entomologist, Prof. Nomenclature, had importuned his paternal relative for an additional piece of mince pie. Unfortunately his digestion was not equal to the task and the peripheral nerve endings in his ileum were irritated and reflexly caused nightmare. The infant's father was awakened by his mutterings and was amazed to hear him describe a curious insect with nine legs, two heads, four bodies and three and a half antennæ. He even detected a name which sounded like *Piea mincea*. The father described the insect in the next issue of the "Weekly Entomologist," and the generic and specific name appeared as *Piea mincea* Willie. This has all been predicted, but we must confess Prof. Nomenclature did not use much discrimination in adopting such methods of description, and especially such an inappropriate name. A name more accurately describing the insect would have been an improvement. See Can. Ent., xxxvi, 82, 1904.

ANOTHER WRONG DETERMINATION IN HOLLAND'S MOTH BOOK.—This time it is one of Prof. Smith's Noctuids and one of our most common species. Fig. 15 on plate xxx is labelled *Drasteria crassiuscula* ♂, but it is the male of *D. erechtea*, the former species not being illustrated in either sex. This wrong determination has caused at least one collector trouble in trying to arrange his captures. When all have contributed their "mites" in the way of corrective determinations for the beautiful and valuable plates in Holland's Moth Book, I hope some one will arrange a list of such corrections.—M. V. SLINGERLAND.

THE POST OFFICE here has been changed from East End to East Falls Church, Virginia; express at Falls Church. Please note this change in my address as it is causing heaps of trouble.—NATHAN BANKS.

MR. CHARLES SCHAFFER of the Brooklyn Institute will revisit the Brownsville, Texas, region at a different season this year, thus hoping to get species not taken on a previous journey.

Doings of Societies.

At the meeting of the Feldman Collecting Social, held April 20th, at the residence of Mr. H. W. Wenzel, 1523 South 13th Street, Philadelphia, twelve persons were present.

Mr. H. W. Wenzel exhibited oak twigs gathered on April 3rd, at Anglesea, N. J., infested by a small Hymenopterous insect, which seemed to confine itself to the young shoots of the trees. It belongs to the Cynipidæ. In reply to Mr. Harbeck, Mr. Wenzel stated that the color of *Cephennium corporosum* is quite variable in immature specimens.

Mr. Wenzel gave an account of an examination of muskrat nests at Anglesea, N. J. Sifting of the dēbris from several nests revealed only a small species of *Philonthus*. These nests were newly built, and he thought that later in the season they might contain more species of insects.

Mr. Boerner showed his collection of weevils.

Mr. Laurent spoke briefly on his recent Florida trip.

Mr. Boerner reported the capture of *Rhæbdoscelis tenuis* at Gloucester, N. J., on July 1st.

WILLIAM J. FOX, *Secretary*.

The eleventh regular quarterly meeting of the Pacific Coast Entomological Society was held on the evening of February 20, 1904, at the residence of Miss Julia Wright, 2329 Pacific Avenue, Alameda, California. President Charles Fuchs in the Chair. Eleven members responded to roll call. Twelve visitors were present. One new member was elected.

Mr. Charles Fuchs read a paper on the "Habits and Value of the *Coccinellidæ*." Mr. Fordyce Grinnell followed with a short biographical sketch of Pierre Joseph Michel Lorquin, "An Early California Collector." Mr. L. E. Ricksecker stated that *Dromæolus californicus* (Elateridæ, subfamily Eucneminæ) is found on Spruce, while the food plant of *Dromæolus hospitalis* is the Alder.

Dr. E. C. Van Dyke stated that he found both *D. humeralis* and *californicus* on pine and spruce, and that Douglass' spruce is probably the food plant.

Mr. Francis X. Williams stated that he found the weather very cold in June at Echo Lake, Shasta County, California. Took a number of Carabidæ and Buprestidæ. A few Lepidoptera—*Thecla dumetorum*, *Lycæna podarce*, and *Sphinx pereclegans*. The country is rocky above the Coniferous belt, the Manzanitas predominating. *Chionobas* were taken there.

Miss Julia Wright exhibited a box of Tasmanian Coleoptera and F. W. Nunenmacher *Hylotrupes ligneus* and *Polycaon* sp.

F. E. BLAISDELL, M. D., *Secretary*.

A regular meeting of the Entomological Section of the Chicago Academy of Sciences was held April 21, 1904. Eleven members present. Mr. Kwiat donated a small box of miscellaneous insects including some of his captures at Osborn, Ind., on April 17th.

The subject of the evening—a talk on Fossil Insects, by Prof. S. W. Williston followed. He gave a resumé of the introduction and distribution of fossil insects, the conditions of fossilization, and the relationships of the early forms. His remarks were illustrated by specimens from the Carboniferous of Mazon Creek, from the Solenhofen beds of Bavaria, and from the Eocene of the Rocky Mountains. He expressed regret that so few students of entomology have become interested in fossil insects, a most fertile and largely unworked field, especially in America. Fossil insects he has found to be much more widely distributed than is generally believed, and although the field is one of peculiar difficulties, is sure to be rich in results.

ALEXANDER KWIAT, *Recorder*.

Rev. Fr. Jerome Schmitt.

It is with great regret that we announce the death of the Rev. Father Jerome Schmitt of Beatty, Penna. The deceased was a Professor in St. Vincent College. He was born in Neuhausen, Wuertemberg, Germany, May 30, 1857. A more extended notice with portrait will appear in September NEWS.

EXCHANGES.

Not Exceeding Three Lines Free to Subscribers.

☞ These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

Lepidoptera.—I have 200 *cecropia*, 100 *polyphemus* and 400 *cynthia* cocoons to exchange for other North American Lepidotpera.—Ferdinand Goeben, 464 Atlantic Ave., Brooklyn, N. Y.

Wanted.—Tortricids and Micro-Lepidoptera, especially from the West. Will pay cash and furnish pins, mailing boxes and full instructions.—W. D. Kearfott, 114 Liberty St., New York, N. Y.

Lepidoptera.—For exchange, fertile eggs of *Hemileuca maia*.—Alfred C. Sampson, Sharon, Mass.

Exchange.—Would like to exchange Coleoptera from Austria for N. American. Correspondence German and French.—Otto Spicack, K. K. Postbeamtor, Sternberg, Mähren, Austria

Illinois, Lake Superior, Texas and Californian Dytiscidæ wanted in exchange for Dytiscidæ and other Coleoptera.—John D Sherman, Jr., 390 Halsey St., Brooklyn, N. Y. City.

Wanted.—In exchange or for cash various species and varieties of the genus *Eubaphe* (*Crocota*). Other Lepidoptera also desired, especially mounted specimens. Send lists to A. Kwiat, 701 Larrabee St., Chicago, Ill.

Polistes.—I wish to correspond with entomologists all over the country who are willing to aid me in the study of this genus.—S. Arthur Johnson, Fort Collins, Colo.

Wanted.—Bulletin Brooklyn Entomological Society, vol. i, No. 10, or the complete volume.—Wm. J. Fox, care of NEWS.

Will exchange North American Lepidoptera for native, Exotic or European species. Send lists to Jos. H. Reading, 775 North Rockwell Street, Chicago, Illinois

A full line of Arizona Coleoptera. Apply to agent, Mr. Chas. Palm, 172 East 64th Street, New York; Dr. R. E. Kunzé, Phœnix, Arizona, U. S A.

Moths of Pennsylvania and New Jersey. The undersigned will give good exchange in cash or specimens for moths of Pennsylvania and New Jersey that are new to his collection. Send list of rare species only. Philip Laurent, 31 East Mt. Airy Ave., Philadelphia, Pa.

Native pupae for exchange, including *regalis, ceanothi, luna, calleta.* Native pupæ desired. W. T. Buxton, 17 Water Street, Somerville, Massachusetts.

Lepidoptera. I have a few *luna* cocoons to exchange for *ceanothi* or pupæ of *Papilios* not found in this locality.—Miss Kate W. Strong, Setauket, Long Island, New York

I have a few live pupæ of *Deidamia inscriptum* to exchange. I wish live pupæ of *Darapsa versicolor* and *Calasymbolus astylus*.—R. R. Rowley, Louisiana, Mo.

Megachilidae of the Americas wanted for study. Will exchange or purchase.—E. S. G. Titus, Div Entom. Dept. Agric., Washington, D. C.

Wanted.—Copies of ENT NEWS for January, 1903, Vol. xiv, No. 1.—Henry Skinner, 1900 Race St, Philadelphia, Penna

Lepidoptera.—*Papilio gundlachianus* for exchange.—Captain Wirt Robinson, Fort Caswell, North Carolina.

Wanted for Cash—Living cocoons or pupæ of Lepidoptera of U. S. A. W. T. Page, 6 Rylett Crescent, Shepherd's Bush, London, W., England.

Lepidoptera to exchange for specimens not yet in my collection. Send lists to Adolph Fischer, 502 School Street, Chicago, Ill.

Exchange.—Coleoptera in papers, with data. Will collect in this locality this season. Send lists.—Rev. J. C. Warren, Argentine, Kans.

Have for exchange.—Named species of Coleoptera, named and unnamed species Lepidoptera, Hymenoptera, Diptera, Neuroptera and Odonata of this locality, for named species of U. S. and Canada.—A.W. Andrews, 180 Helen Ave., Detroit, Mich.

Wanted.—Material for the study of the hybrid or polymorphic butterflies of the genus *Basilarchia*, including larvæ or pupæ of *arthemis* or *astyanax*, imagos of *proserpina* or *arthechippus*, or any specimens showing unusual characters. Liberal exchange. Specimens retained will be deposited in Museum of Comparative Zoology.—W. L. W. Field, Milton, Mass.

Cicindela wanted (Henshaw Numbers 19 to 32b inclusive), Coleoptera for exchange. Will collect in all Orders. Write before collecting.—V. E. Shelford, Zoology Building, Univ. of Chicago, Chicago, Ill.

Butterflies.—Will collect in this vicinity the coming season in exchange for named specimens in papers or expanded, found in other localities.—C. E. Montgomery, 10 Cabot St , Portsmouth, N. H.

Wanted—Insect galls and host plants for the study of distribution. Will exchange specimens.—Mel T. Cook, Greencastle, Ind.

Wanted.—Fertile eggs of *Citheronia regalis* and *Basilana imperialis*. Will pay cash for twenty-four of each.—Phineas Whitng, 106 Fairmount St., Lowell, Mass.

Fertile ova of *Attacus yama-mai*, *Rhodia fugax*, *Calligula japonica* and *cecropia-ceanothi* hybrids for good exchange; will give cash or exchange for pupæ of *angulifera* and *ova* of *H. nevadensis*.—Jas. Mitchell, 212 Indiana Trust Building, Indianapolis, Indiana

I have *Triptogon occidentalis*, *modesta*, *Sphinx chersis*, *Amp. versicolor*, *Catocala relicta* var. *bianca*, *phalanga*, *lacrymosa*, *frederici* and pupæ of *P. astylus* in exchange for others of same genus or for small white roses.—Chas. F. Timm, 131 Ralph St., Brooklyn, N. Y.

Orthoptera.—Determined Colorado species to exchange for species not represented in the Collection here. C. P. Gillete, Ft. Collins, Colo.

Wanted —*Papilios* of the world. Must be perfect. Send list and state what you wish in exchange. C. F. Groth, 141 E. 40th St., New York.

Wanted in southern and western United States correspondents who will collect *Cicindela* in exchange for named Coleoptera of Mexico, South and Central America, Europe and Australia. Write at once. Zoological Museum, 37 Zoological Building. University of Chicago, Chicago.

Insects of all orders, chiefly from Kansas, Colorado, New Mexico and Arizona, for North Amercan species not in my collection. List of duplicates and desiderata on application. F. H. Snow, Lawrence, Kansas. (Prof. Systematic Entemology in the University of Kansas.)

Wanted, to complete files: Illinois State Laboratory Natural History, Bulletin, Vol. i, Nos. 3 and 4; Vol. iv, articles, 9, 14 and 15; Vol. v, articles 1 and 6 Many valuable exchanges to offer in different groups and subjects. James G. Needham, Lake Forest, Ill.

Wanted, for cash or exchange.—Fitch's 4th Report on Insects of New York; Smith's Reports on New Jersey Insects for 1899 and 1902; Bulletins 9 and 33 (old series), Parts iv and vi, Bibliography of Economic Entomology, Div. of Ent , U. S. Dept. Agr ; 15th, 16th, 18th and 19th Reports on Illinois Insects.—W. E. Britton, Agr. Exp. Sta., New Haven, Conn.

FOR SALE CHEAP

for cash—collection of Coleoptera, Diptera, Hymenoptera and Hemiptera. 5000 species, 25,000 specimens contained in 250 Schmitt and other boxes. All in first-class condition. Determinations by best Amer. and Europ. specialists

WM. A. NASON, ALGONQUIN, ILLINOIS.

AUSTRALIAN COLEOPTERA

100 species, about 250 specimens, each wrapped in tissue paper and mostly named, $5.00. P. O. Order with order.

F. BILLINGHURST

NATIONAL BANK, BACCHUS MARSCH, VICTORIA, AUSTRALIA

Catalogue of the Coccidæ of the World.

BY MRS MARIA E. FERNALD.

PRICE PER COPY $2.00 NET.

The Experiment Station edition has been exhausted and an author's edition having been published is now offered for sale. Mailed on receipt of price.

Prof. C. H. Fernald, Amherst, Mass.

A LIMITED NUMBER

of sets of the twenty-seven plates of Sphingidæ by Weidemeyer, Calverley and Edwards, may be procured at $5 00 per set from the Librarian of the

BROOKLYN INSTITUTE MUSEUM,

Eastern Parkway, Brooklyn, New York.

FOR SALE

Entomologica America, Vols. 1–6 in parts unbound..... .. ..$15.00

Entomological News, Vols. 1–14 in parts unbound 20.00

FRED. C. BOWDITCH, 164 Rawson Road, Brookline, Mass.

FROM JAPAN

LIVE COCOONS of *Attacus pryri* at 25 cents each.

FERTILIZED OVA of *Calligula japonica* (Oak), *Rhodia fugax* (Oak, Chestnut) and *Antherea yamamai* (Oak, Chestnut), at 20 cts. per dozen.

IMAGOES in papers, first class, 5 for $1.00, all fine specimens.

JOHN H. MATTHEWS, 3219 N. 13th St., Philadelphia, Pa.

When Writing Please Mention "Entomological News."

AMERICAN ENTOMOLOGICAL COMPANY

1040 DE KALB AVENUE

BROOKLYN, N. Y.

PRICE LIST No. 5

SUPPLEMENT TO

PRICE LIST No. 4

AND

NEW ILLUSTRATED CATALOGUE OF ENTOMOLOGICAL SUPPLIES, JANUARY 1, 1904

Manufacturers of the Original and Only Genuine

SCHMITT INSECT BOXES

BUILDERS OF CABINETS AND INSECT CASES

NEW FEATURES OF INTEREST TO EVERY ENTOMOLOGIST

THE KNY-SCHEERER CO.

DEPARTMERT OF NATURAL SCIENCE.

G. LAGAI, Ph.D.

225-233 FOURTH AVE. - - NEW YORK, N. Y.

ENTOMOLOGICAL SPECIMENS.

North American and Exotic Insects at Reduced Prices.
School Collections.
Metamorphoses.
Biological Models.
Wall Charts.
Write for Special Quotations

Saturnia anona Ottol.
(Arizona)
♂ and ♀ $2.00; 2 pairs, $3.00.

ENTOMOLOGICAL SUPPLIES.

Lantern Slides.
Boxes.
Cases.
Cabinets.
Forceps.
Pins. Nets.
Dissecting Instruments.
Museum Supplies.

New Illustrated Catalogue on Application

When Writing Please Mention "Entomological News."

P. C STOCKHAUSEN, PRINTER 58 N 7TH ST. PHILADELPHIA